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Editorial

PROJECT INTEGRATION MANAGEMENT AND IMPLEMENTATION OF MOBILE TELECOMMUNICATION NETWORK PROJECTS IN KENYA

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Abstract

Purpose: *Telecommunications operators need to implement projects in order to respond to the inherent dynamism in the sector and take advantage of the growth opportunities that are available in the sector. This situation calls for project integration management practices that can contribute to effectiveness and efficiency in implementation of projects. The objective of the study is therefore to establish the influence of project integration management practices on the implementation of mobile telecommunication network projects in Kenya.*

Methodology: *Descriptive survey research design was adopted for this study. The target population was 82 respondents based on 41 network projects carried out by Safaricom Public Limited Company (PLC) and Telkom Kenya Ltd. Stratified sampling was used in this study. The study used primary data collected through the use of questionnaires. Descriptive and inferential statistics was used to analyze the data. The study used multiple regression analysis to analyze the degree of relationship between the variables in the study at 5% level of significance.*

Results: *The study found that project integration management practices were critical in the implementation of mobile telecommunication network projects. Regression analysis showed statistically significant positive association between the four aspects of project integration management practices (stakeholder engagement, communication management, risk management, and change control), and implementation of mobile telecommunication network projects.*

Unique contribution to Theory, Practice and Policy: *The study recommends that telecommunications network operators should institutionalize the four aspects of project integration management practices through regular sensitization of project teams, and integrating the four aspects into project performance assessment criteria.*

Keywords

Project Management Practices, Project Integration Management, Stakeholder Engagement, Communication Management, Risk Management, Change Control, Project Implementation

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1.0 INTRODUCTION

Project integration management is critical for implementation of projects in order to achieve the desired project objectives such as completion within the set budget and schedule. According to Westland (2022), Project integration management is one of the ten (10) key knowledge areas in the PMBOK Project Management Book of Knowledge). Project management is expressed as the capability to deliver, with due diligence, a project product that fulfils a given mission, by organising a dedicated project team, effectively combining the most appropriate technical and managerial methods and techniques, and formulating the most efficient and effective implementation means (Ohara, 2015). Project integration management is a subset of project management, and involves the coordinating certain aspects such as stakeholder demands, customer expectations, and activities in order to successfully implement a project. Project integration management practices can therefore contribute to efficient and effective implementation of projects.

The contribution of the mobile telecommunications sector towards growth of the economy has been immense through its effective participation in the telecommunication industry (Miller, 2016). The telecommunications operators however face the challenge of inherent dynamism in the sector that requires them to continuously expand and upgrade network infrastructure capacity in order to support the ever changing and increasing consumer demands. This is due to the ever-increasing demand for high-speed connectivity and faster protocols for data transfer (Tridens Technology, 2020). Global Information Communication Technologies (ICT) trends continue to indicate increased growth in mobile-cellular services, Internet services and broadband services (Communications Authority of Kenya, 2020a). With respect to Europe, Fifth Generation (5G) mobile network coverage growth is forecast to reach three-quarters of the population in Europe by the year 2025 (GSMA, 2018). Within the African region, Fourth Generation (4G) mobile networks in Sub-Saharan Africa will double to 28% by the year 2025, compared to a global average of 57% (GSMA, 2021). This means there is increasing need for investment in projects to implement telecommunication networks upgrades to meet the growing demand.

Currently, there are three mobile telecommunications operators namely Safaricom Ltd, Telkom Kenya Ltd, and Airtel Networks Kenya Ltd. Since the liberalization of the telecommunications sector in Kenya in the year 1999, there has been growth in the mobile service. Mobile connectivity in Kenya increased from 37% to 49.6% during the five-year period ending in the year 2019 (Mukora, Njeru, & Syekei, 2021). Further, the broadband subscriptions were 27.5 million having grown by 6.7 percent from 25.8 million during the previous quarter (Communications Authority of Kenya, 2021). The Fifth Generation (5G) technology is also expected to enhance the capacity of the telecommunications sector to utilize the available growth opportunities (Communications Authority of Kenya, 2021). Frost and Sullivan (2018) forecasts that the telecommunications market in Kenya will expand from United States Dollars (USD) 2.74 billion to USD 3.49 billion in the year 2022. The increasing consumer demands and technological developments are driving the requirement for mobile operators to continuously migrate to more advanced networks. This challenge of having adequate network infrastructure is significant since the development and maintenance of network infrastructure is capital intensive. For instance, the Communications Authority of Kenya sector statistics report indicates that investments in the mobile sub-sector grew to

Kenya Shillings (KES) 45.9 billion in the year 2020 from KES 35.6 billion in the year 2019. The telecommunications operators therefore need to focus on project integration management practices that need to be managed carefully in order to implement the said projects successfully, while taking advantage of the growth opportunities that are available in the telecommunications sector.

The project integration management practices that were addressed in this study are stakeholder engagement, communication management, risk management, and change control. According to Chandra (2019), project implementation refers to the process of actualizing the investment plan by putting certain specific actions and structures in place in order to operationalize the investment dream and subsequently derive the targeted benefits from the project. The project implementation process is complex and usually requires extensive and collective attention to a broad aspect of human, budgetary and technical variables (Pinto, 2020). Project implementation involves executing the project plan, and organizing and directing resources, in order to meet the project objectives. Since the telecommunications sector is dynamic, project implementation experiences external threats such as unforeseen events, ever increasing demands, evolving constraints, and limited resources. It is therefore expected that if project integration management practices are applied and managed effectively and efficiently, then the chances of success are high. This study thus sought to examine project integration management practices that influence the implementation of mobile telecommunications network projects in Kenya. This is expected to mitigate the challenge arising from the dynamism in the sector, and to exploit the growth opportunities in the sector.

2.0 STATEMENT OF THE PROBLEM

Telecommunications operators need to implement projects in order to respond to the ever-increasing demands from the dynamic sector and the growth opportunities. In the year 2020, 26% of projects in the telecommunications sector did not meet their original goals, 35% exceeded budgets, 43% delayed, while 24% experienced scope creep (PMI, 2021). According to Ochuodho (2021), over 70% of large IT projects in Kenya do not get completed on time or exceed budgets, and cases in the private sector never make it to the public limelight despite project failure costs being passed to the customers. The network operators face the challenge of developing adequate network infrastructure due to the dynamic nature of the telecommunications sector. For instance, the overall average quality of service performance level for the mobile operators over the past five years has been below the minimum specified requirement (Communications Authority of Kenya, 2020b). This problem is significant considering the level of investment involved. For instance, the network expansion projects cost in 2019 for one mobile operator was KES 37.25 billion, and was expected to be in the range of KES 36 to 39 billion in the subsequent year (Safaricom, 2019). This situation motivated this study that sought to identify critical project integration management practices that can contribute to effectiveness and efficiency in implementation of mobile telecommunication network projects, hence mitigating the problem. There is literature on project management practices at the level of organizations but little for the telecommunications sector. Njiru (2018) surveyed project management practices, but the study was on the manufacturing sector. This study therefore sought to extend this to the telecommunications sector in order to fill the existing knowledge gap on critical project integration management practices in the telecommunications sector in Kenya.

3.0 LITERATURE REVIEW

This study was guided by Stakeholder theory, Information theory, Project Risk Analysis and Management (PRAM) model, and Change control model. The stakeholder theory was used to

explain how stakeholder engagement affects project implementation. This theory recognizes the need to involve other parties in addition to the primary owner or implementer of the undertaking, in order to achieve project success. According to Bourne and Walker (2016), stakeholders can increase the range of skills, knowledge, and experiences available to the project. Wojewnik-Filipkowska *et al.* (2019) also established that early public engagement contributes to infrastructure-project value in terms of effectiveness, sustainability and utility. The information theory was used to explain the influence of communication management on the implementation of projects. The information theory provides a framework to design effective project teams. The main challenge is to design an appropriate structure with information management capacity that matches unique project demands for optimal performance. Yang *et al.* (2020) concluded that the retrieval of the information contributes towards lessons learned, and can be enhanced through using an array of information communication systems. The Project Risk Analysis and Management (PRAM) model was used to guide in analyzing the influence of risk management practices in implementation of projects. The PRAM model includes the steps of identification, analysis, response planning, response action implementation, and monitoring and tracking of risks throughout the project life cycle, hence enabling the management of project risks. The Change control model was used to assist in analyzing the influence of change control practices in the implementation of projects. According to PMI (2017), change control ensures that changes are not done arbitrarily, but after detailed definition, evaluation, and approval. The Change control model has the stages of setting baseline, change definition, evaluation, decision-making, communication, implementation and monitoring, and closure. According to Panorama Consulting Group (2021), the phases in change control are project management plan creation, change request documentation, change impact analysis, decision making, communication, and project management plan update.

3.2 Conceptual Framework

The conceptual framework in Figure 1 shows the relationship between the variables in the study. The independent variables are stakeholder engagement, communication management, risk management, and change control, while the dependent variable is project implementation.

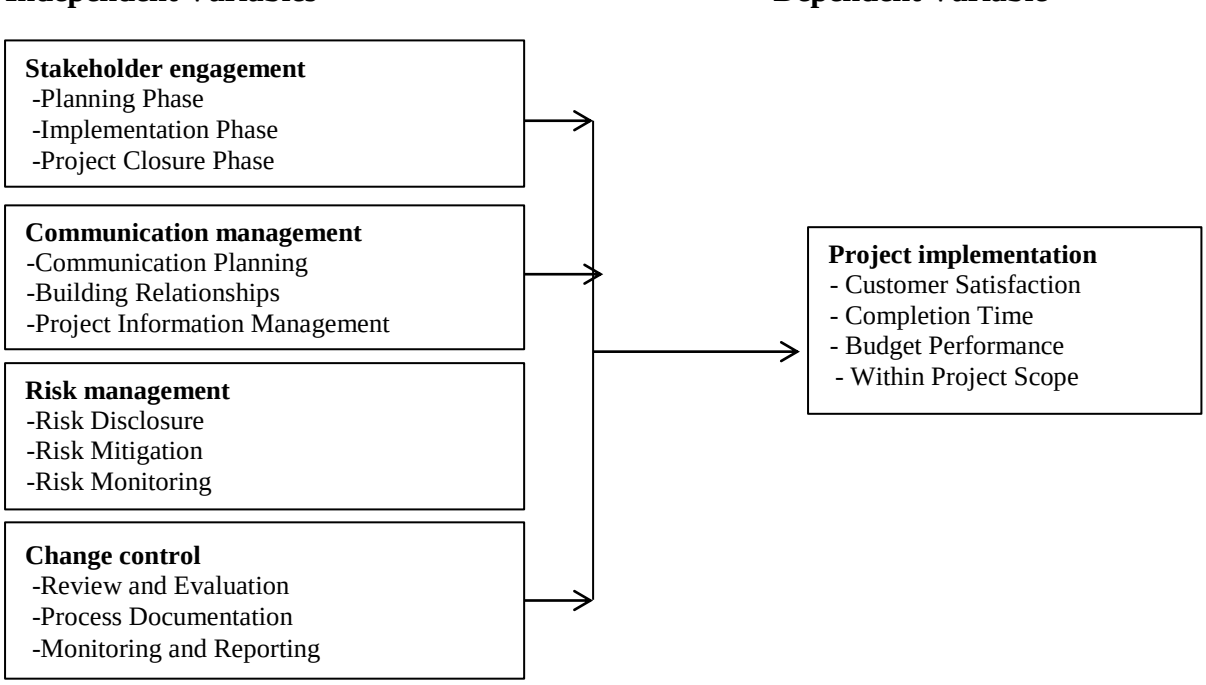

Figure 1: Conceptual Framework

3.3 Empirical Review

According to Mukherjee (2019), stakeholder engagement is complex due to the unclear nature of the constraints and variables involved in project implementation. Some empirical studies show that stakeholder engagement influences project implementation. Njiru (2018) established positive relationship between stakeholder participation and project implementation based on 49 Nairobi-based manufacturing companies. Kavita-Musembi *et al.* (2018) also established that stakeholder management skills contribute to project performance. The study was based in the energy sector in Kenya, and used a population of 94 projects. In Ghana, Tengan and Aigbavboa (2017) established that poor stakeholder engagement contributed to failure in the local government construction projects. Hirpa (2022) also assessed the effect of stakeholder management on the project performance in a telecommunications project in Ethiopia. The study established that stakeholder management contributes to project success. With respect to communications management, Mugo and Moronge (2018) found out that a communication plan and clear roles enhanced project implementation. The study was in the construction sector, and was based on 80 building projects in Nairobi. In the energy sector, Kavita-Musembi *et al.* (2018) also established that communication skills affect project performance. In Nigeria, Yakubu, Ogunsanmi, and Yakubu (2019) study based on the construction industry, showed that effective communication contributes towards project performance. Haftom (2019) also assessed the project management practices of telecom expansion project on project performance in Ethio Telecom, and identified project communication as one of the key project management practices for successful project performance. On risk management, Maritim and Chelule (2018) examined project risk management practices on telecommunication network projects in Kenya. The study was based on a 60 projects in Safaricom PLC, and concluded that the risk identification, risk monitoring, and risk response planning affects project performance. Pimchangthong and Boonjing (2017) study on IT projects performance in Thaliand supports this conclusion. Gitau and Sang (2022) also identified risk management practice as one of the sustainable project management practices that contribute to project cost efficiency, and completion of the projects within schedule, as per quality standards, and within scope. With respect to change control, Karimi and Munyori (2019) investigated the role of change control in project success within the telecommunications industry in Uganda, and established that change control influences project implementation. The study indicated that effective communication, process documentation, and effective feedback to all relevant stakeholders contribute to project success. Further, in Somaliland, Abdilahi, Fakunle, and Fashina (2020) carried out a study on performance of telecommunications projects, and established that project scope control is critical in the performance of telecommunication projects. According to Warner (2018), a risk treatment plan can help project members and stakeholders in assessing the impact of the proposed changes. Most of the studies reviewed however have either been conducted in other sectors in Kenya, or in other countries. There was therefore need for this study in order to assess the project integration management practices in the telecommunications sector in Kenya.

4.0 RESEARCH METHODOLOGY

This study adopted descriptive survey research design. The target population for the study was mobile network projects carried out by Safaricom Public Limited Company (PLC) and Telkom Kenya Ltd in the past three years. The unit of observation was 82 project supervisors and technical team leaders in charge of the 41 targeted projects. Stratified sampling was used to select a sample of 68 out of the 82 targeted respondents. The study used primary data collected through the use of questionnaires. Descriptive and inferential statistics was used to analyze the data. The study used multiple regression analysis and Analysis of Variance (ANOVA) to analyze the degree of relationship between the variables in the study at 5% level of significance.

5.0 FINDINGS

5.1 General Information Results

5.1.1Education Level Performance

The respondents were asked to indicate their highest level of education. The table below shows the distribution of respondents by education level.

Table 1: Distribution of respondents by education level

Education Level	Frequency	Percent
Postgraduate	27	45.8
Undergraduate	32	54.2

From Table 1 above, the respondents had tertiary education with 54.2% being undergraduates while 45.8% were postgraduates. This inferred that the respondents were likely to have had a good understanding of the influence of project integration management practices in implementation of mobile telecommunication network projects in their respective organizations. Similarly, in study by Njiru (2018), evaluating the influence of various project management practices on projects implementation in various settings, the respondents had tertiary level education, hence in a position to provide valuable insights as to how project management practices influenced implementation of projects in their organizations.

5.1.2 Length of service

The study sought to establish how long the respondents had served the organization. The table below shows the distribution of respondents by length of service.

Table 2: Distribution of respondents by length of service

Length of Service	Frequency	Percent
Above 12 years	18	30.5
8-11 years	20	33.9
4-7 years	16	27.1
Under 4 years	5	8.5

From Table 2 above, majority of the respondents (91.5%) had worked in their organization for over four (4) years, and therefore well experienced in implementation of various mobile

telecommunication network projects in their organizations. This means the respondents had the relevant knowledge and experience to provide the required information for the study. The findings agreed with those of studies by Mulewa et al. (2019), whose respondents had a considerable work experience by virtue of having worked in their organizations for long and having been involved in projects implementation activities for long.

5.2 Descriptive Statistics

The respondents were asked to rate the level of their agreement on a 5-point Likert scale where 1 was strongly disagree and 5 was strongly agree.

5.2.1 Stakeholder Engagement and Project Implementation

The study used seven indicators of stakeholder engagement, which were in the form of statements. The table below shows the results.

Table 3: Levels of agreement with stakeholder engagement indicators

Statements	D	N	A	SA
Stakeholder engagement ensured in the planning phase	3 5.1%	9 15.3%	22 37.3%	25 42.4%
Stakeholders validated project requirements and expectations	7 11.9%	10 16.9%	24 40.7%	18 30.5%
Contributed to the commitment of project resources and support	5 8.5%	10 16.9%	25 42.4%	19 32.2%
Stakeholders were effectively involved in decision making	5 8.5%	13 22.0%	26 44.1%	15 25.4%
Provided inputs and feedback on deviations/corrective actions	4 6.8%	13 22.0%	32 54.2%	10 16.9%
Stakeholders were involved in setting project closure criteria	3 5.1%	18 30.5%	29 49.2%	9 15.3%
Provided inputs and feedback on project closure data analysis and lessons learnt	5 8.5%	15 25.4%	27 45.8%	12 20.3%

From Table 3 above, the respondents were in agreement with the assertions that their organization ensured stakeholder engagement in the planning phase (79.7%); stakeholder engagement contributed to the commitment of the required project resources and support (74.6%); stakeholders were involved in validating project requirements and expectations (71.2%); stakeholders were given the opportunity to provide inputs or feedback on project deviations and corrective actions (71.1%); stakeholders were effectively involved in decision making processes during project implementation (69.5%); stakeholders provided inputs and feedback during project closure on data analysis and lessons learnt (66.1%) and that stakeholders were directly involved in setting the criteria for the project closure process (64.5%). This showed that the respondents were cognizant that stakeholder engagement was a critical component in the implementation of mobile telecommunication network projects in their organization. This showed that stakeholder engagement was a project management practice with strong influence on implementation of mobile telecommunication network projects in their organizations.

5.2.2 Communication Management and Project Implementation

The study used eleven indicators to measure communication management. The table below shows the results.

Table 4: Levels of agreement with communication management indicators

Statements	D	N	A	SA
Clear lines and responsibilities were established up front	7 11.9%	8 13.6%	21 35.6%	23 39.0%
There was common working language among project team	1 1.7%	11 18.6%	26 44.1%	21 35.6%
Cross-cultural competence was developed in our project team	2 3.4 %	12 20.3%	27 45.8%	18 30.5%
Satisfied with communication channels used	6 10.2%	10 16.9%	23 39%	20 33.9%
Satisfied with information generation and collection	6 10.2%	13 22%	25 42.4%	15 25.4%
Satisfied with information storage and dissemination	5 8.5%	14 23.7%	21 35.6%	19 32.2%
Satisfied with project kick-off and review meetings	3 5.1%	10 16.9%	25 42.4%	21 35.6%
We had regular face-to-face communication	6 10.2%	9 15.3%	27 45.8%	17 28.8%
Team members were asked for advice, opinions, feedback	3 5.1%	11 18.6%	29 49.2%	16 27.1%
Use of social media was satisfactory	7 11.9%	15 25.4%	25 42.4%	12 20.3%
There was regular review of communication plans	5 8.5%	14 23.7%	22 37.3%	18 30.5%

From Table 4 above, respondents were in agreement with the assertions that there was a common working language among team members (79.7%); they were satisfied with project kick-off and review meetings (78.0%); cross-cultural competence was developed in their project team (76.3%); clear lines and responsibilities were established up front (74.6%); team members were asked for advice, opinions, or feedback (76.3%); they had regular face-to-face communication during project implementation (74.6%); they were satisfied with the channels of communication used in project implementation (72.9%); they had effective methods of storage and dissemination of project information (67.8%); there was regular review and adjustments of communication plans (67.8%); they were satisfied with the methods of generating and collecting information in project implementation (67.8%); and that use of social media was satisfactory). This implied that the respondents did acknowledge that communication management was an essential element and played an instrumental role in the implementation of mobile telecommunication network projects in their organizations.

5.2.3 Risk Management and Project Implementation

The study used nine indicators to measure risk management. The table below shows the results.

Table 5: Levels of agreement with risk management indicators

Statements	D	N	A	SA
Information from past projects was used to identify risks	1 1.7%	11 18.6%	21 35.6%	26 44.1%
I am satisfied with the level of risk disclosure practices adopted	4 6.8%	14 23.7%	27 45.8%	14 23.7%
Brainstorming and interviewing was used to identify risks	2 3.4%	15 25.4%	18 30.5%	24 40.7%
The risk exposure for project was estimated in advance	6 10.2%	16 27.1%	21 35.6%	16 27.1%
The project design or scope was reviewed to mitigate risks	4 6.8%	12 20.3%	22 37.3%	21 35.6%
Some specialized project scope was contracted to third parties	5 8.5%	16 27.1%	23 39.0%	15 25.4%
Adequate resources were allocated for risk mitigation	5 8.5%	18 30.5%	25 42.4%	11 18.6%
We reclassified some risks after their level of severity changed	4 6.8%	10 16.9%	27 45.8%	18 30.5%
We planned for new risks in advance throughout the project cycle	6 10.2%	16 27.1%	24 40.7%	13 22.0%

From Table 5, it was evident that the respondents concurred with the assertions that information from past projects was used to identify risks (79.7%); they reclassified some risks after their level of severity changed (76.3%); the project design or scope was reviewed to mitigate identified risks (72.9%); brainstorming and interviewing of members was used to identify risks (71.2%); they were satisfied with the level of risk disclosure practices adopted in project implementation (69.5%); some specialized project scope was contracted to third parties (64.4%); the risk exposure for project was estimated in advance (62.7%); they planned for new risks in advance throughout the project cycle (62.7%) and that adequate resources were allocated for risk mitigation actions (61.0%). This implied that the respondents did recognize that risk management was a critical component that was instrumental in the implementation of mobile telecommunication network projects in their organizations.

5.2.4 Change Control and Project Implementation

The study used nine indicators to measure change control. The table below shows the results.

Table 6: Levels of agreement with change control indicators

Statements	D	N	A	SA
Proposed changes were documented and tracked	3(5.1%	7(11.9 %	31(52.5%	18(30.5 %
The entire change process was documented	4 6.8%	9 15.3%	25 42.4%	21 35.6%
Change control documents were clear and accessible	7 11.9%	12 20.3%	20 33.9%	20 33.9%
Changes were reviewed and evaluated before approval	5 8.5%	12 20.3%	27 45.8%	15 25.4%
Risk management was used to inform decisions	6 10.2%	12 20.3%	23 39.0%	18 30.5%
Changes effectively communicated to relevant parties	5 8.5%	9 15.3%	26 44.1%	19 32.2%
Relevant stakeholders were engaged on proposed changes	3 5.1%	16 27.1%	27 45.8%	13 22.0%
Change control ensured effective and efficient use of resources	6 10.2%	15 25.4%	21 35.6%	17 28.8%
I am satisfied with the level of monitoring and tracking changes	5 8.5%	10 16.9%	28 47.5%	16 27.1%

From Table 6, the respondents were in agreement with the assertions that proposed changes were documented and tracked (83.0%); the entire change process was documented (78.0%); changes were effectively communicated to all relevant parties (76.3%); they were satisfied with the level of monitoring and tracking changes during project implementation (74.6%); changes were reviewed and evaluated before consideration for approval (71.2%); risk management was used to inform decisions on proposed changes (69.5%); change control policies, procedures, processes, and tools were clearly documented and accessible to relevant parties (67.8%); all relevant stakeholders were engaged on proposed changes (67.8%) and that change control ensured effective and efficient use of resources (64.4%). This showed that the respondents did appreciate that change control played a crucial role in the in the implementation of mobile telecommunication network projects in their organization.

Inferential Statistics

The study sought to establish the combined influence of all the project integration management practices on the implementation of telecommunication mobile network projects. Multivariate regression analysis was used. The results obtained were as displayed in the two tables below.

Table 7: Regression Model Summary for the influence of project integration management practices on project implementation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.810[a]	.656	.631	1.01973

Predictors: (Constant), stakeholder engagement, communication management, risk management and change control

According to Table 7, R square is the coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variables. The value of R square was 0.656 which meant that 65.6% variation in the dependent variable (implementation of mobile telecommunication network projects in Safaricom PLC and Telkom Kenya Ltd) was due to variations in the four predictor variables (that is, stakeholder engagement, communication management, risk management and change control). The remaining 34.4% of variation in the implementation of mobile telecommunication network projects in Safaricom PLC and Telkom Kenya Ltd was explained by other factors not in the model.

Table 8: Regression Coefficients for the influence of project integration management practices on project implementation

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	4.026	.522		7.713	.0000
Stakeholder engagement [X_1]	0.709	.167	.671	4.246	.0001
Communication management [X_2]	0.781	.156	.739	5.006	.0000
Risk management [X_3]	0.672	.194	.625	3.464	.0011
Change control [X_4]	0.643	.211	.594	3.047	.0017

From Table 8, results show that there was statistically significant positive association between stakeholder engagement, communication management, risk management as well as change control, and implementation of mobile telecommunication network projects in Kenya as depicted by beta values of 0.709, 0.781, 0.672, and 0.643 (with all having $p<0.05$), respectively. Similar findings were reported by Njiru (2018) and Mulewa et al. (2019) who found statistically significant positive relationship between stakeholder engagement and project implementation. Afroze and Khan (2017), Haftom (2019), and Yakubu et al. (2019) also reported that statistically significant positive relationship between communication management and project implementation. Similarly, Maritim and Chelule (2018), and Gitau and Sang (2022) concurred that risk management positively and significantly impacted projects implementation. Karimi and Munyori (2019) also identified the existence of a statistically significant relationship between change control and project implementation. These findings mean that improvement in stakeholder engagement, communication management, risk management, or change control, can lead to more enhanced implementation of mobile telecommunication network projects in Kenya.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The study concludes that stakeholder engagement, communication management, risk management, and change control were critical project integration management practices that played a significant role in enhancing the implementation of mobile telecommunication network projects in Kenya.

The study recommends that telecommunications network operators should institutionalize the four aspects of project integration management practices through regular sensitization of project teams, integrating the four aspects into project performance assessment criteria.

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