



**PROJECT INTEGRATION MANAGEMENT AND PERFORMANCE OF  
DIGITALIZED PROJECTS IN TELECOMMUNICATIONS INDUSTRY IN NAIROBI  
CITY COUNTY, KENYA**

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**ABSTRACT**

Project integration management involved coordinating certain aspects such as stakeholder demands, customer expectations, and activities to successfully implement a project. Project integration management practices can contribute to efficient and effective implementation of projects. The main objective was to determine the effect of project integration management on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya. The specific objectives were to examine effect of integrating project knowledge and managing project work on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya. The study was guided by knowledge management theory and resource dependency theory. The study adopted a descriptive survey design. The unit of analysis was 12 main mobile money transfer projects implemented by three telecommunication companies in Kenya. The study unit of observation was 15 program managers, 70 project coordinators, and 180 project staff. Sampling while the project coordinators and project staff was sampled using simple random sampling. Yamane 1967 formula was used to sample 160 respondents selected using stratified random sampling. The study used questionnaires to collect data. The pilot was conducted with 25 staff from the telecommunication firms. The study used content and construct validity. Reliability was measured using Cronbach's Alpha Coefficient with a cut of point of 0.7. The data was analyzed analysis using Statistical Package for Social Sciences (SPSS) Version 28. The study used descriptive and inferential statistics. Data was presented in tables. Findings show that; there is a strong significant relationship between integrating project knowledge and performance of digitalized projects was ( $r= 0.904$ ,  $p\text{-value}=0.000$ ) and a strong significant relationship between managing project work and performance of digitalized projects was ( $r = 0.926$ ,  $p\text{-value}=0.000$ ). The study recommendations are project scope changes must be understood by the project managers as well as all parties involved, project team members should not only share their own knowledge but also facilitate access to their informal knowledge networks and communities of practice, work breakdown structure should be well documented to guide the project activities, and there should be a well-documented process of monitoring overall project performance.

**Key Word:** Project Integration Management, Integrating Project Knowledge, Managing Project Work and Performance of Digitalized Projects

### **Background of the Study**

Project integration management involves coordinating certain aspects such as stakeholder demands, customer expectations, and activities to successfully implement a project. Project integration management practices can contribute to efficient and effective implementation of projects. In order to improve value to the owner, reduce waste, and raise the efficiency of all stages of the project, integrated project management guarantees that projects are not managed in isolation. Instead, it places an emphasis on integrating people, systems, business structures, and practices. Integration considers not only how parts of a project connect to one another, but also how parts of an organization relate to a project. Project integration management is one of the ten major knowledge areas in project management (Project Management Book of Knowledge, 2021).

According to Desalegn (2018), project integration management is a subset of project management that focuses on the steps taken when carrying out a process. Project integration managers coordinate strategies, aid in making sure that all project procedures are effective and help keep the team's members moving in the right direction toward their end objectives. Project operations are properly coordinated when projects are integrated. Therefore, project managers can benefit from the advantages of properly integrated project operations by understanding how integration management affects project success (Hall & Levitt, 2018). Due to the usage of many collaborative tools by Swedish construction companies, trust is highly valued. Project managers are also able to solve problems in a collaborative manner (Aghania & Ramzani, 2019).

Mancini et al., (2017) noted that collaboration process in project management affects the budget and schedule of a project. Contractors were delayed by the organizations' collaboration process. According to Löfgren and Eriksson (2019), projects with partners outperform projects without partners in terms of cost control, technical performance, and customer satisfaction. The work environment that results when project team members interact truly and in accordance with project objectives fosters knowledge exchange, facilitating a more thorough and equitable grasp of the project context. As a result, the project team becomes more cohesive, has a deeper awareness of the project's state, and is better equipped to deal with ambiguity and uncertainty. As a result, ambiguous and uncertain circumstances can be managed much more successfully by applying shared understanding to crucial decision-making processes and coordinated actions. A digitization project is a project that includes migrating services from an analog format to a digital format (Denner, Lockl, & Roeglinger, 2022). Applied in the context of the current study, digitization projects are projects aimed at changing personal and business money transfer services from hard cash to soft cash whereby money is transferred through the mobile money services.

According to Boruett and Musembi (2022), project integration management is a subset of project management and involves the coordinating of certain aspects such as stakeholder demands, customer expectations, and activities in order to successfully implement a project. Project integration management practices can contribute to efficient and effective implementation of projects. Project integration management practices were critical in the implementation of mobile telecommunication network projects. Project integration management practices included stakeholder engagement, communication management, risk management, and change control.

During project integration management, a charter is developed, a project plan developed, the project work and project knowledge are managed, monitoring and control is carried out, and change control is performed (Githinji, 2022). Kirima and Munyori (2019) noted that it is necessary to have a unified change management process that incorporates an integrated change control section. The project management board reviews, analyzes, approves, rejects or returns change requests as proposed by various stakeholders of the organization at any point in time in.

### **Statement of the Problem**

The telecommunications firms have implemented several digitalized projects to improve service delivery. In April last 2022, Safaricom, Airtel and Telkom Kenya launched merchant interoperability on their mobile money networks as an industry-led initiative to ease the cost for subscribers transacting across networks. However, the wallet-to-wallet interoperability platform is struggling to break the hold of M-Pesa among subscribers. The value of transactions through the merchant interpretability platform stood at Sh1 billion recorded from 69,400 merchants for the year ended March 2023. This is a fraction of the total value of customer-to-business (C2B) and business-to-business (B2B) payments which stood at Sh6.5 trillion. Moreover, 59% of Airtel Money and T-Kash agents have recorded a decrease in commission rates. The slow uptake of merchant interoperability in the first year of the partnership indicates that Airtel Money and T-Kash are still struggling to grow market share in the lucrative sector despite regulatory interventions (CA, 2023).

CCK (2021) survey showed that in 2020, 26% of mobile money projects in the telecommunications sector did not meet their purposed objectives, 35% experienced budget overruns, and 43% were delivered late. Lobute (2021) established that 53.7% of software projects in the telecommunications sector in Kenya fail, with mean time overrun of 27% and mean cost overrun of 33% with mean percentage of functionality delivered of 84%. According to Communications Authority of Kenya (2020) quality of service report shows that the telecomm operators have consistently failed to meet some of the Key Performance Indicators (KPIs) used to gauge the extent to which their services conform to the required standard, achieving a score of 62.8% against a target of 80%. There are limited studies on project integration in telecommunication sector in Kenya since only two scholars have focused on project integration: Boruett & Musembi (2022), Kavishe & Chileshe, (2018). The study aimed at filling the research gap by examining the effect of project management integration on performance of selected digitalized projects in telecommunications industry in Nairobi County, Kenya.

### **General Objective**

To determine the effect of project integration management on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya.

### **Specific Objectives of the study**

- i. To examine the effect of integrating project knowledge on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya
- ii. To assess the effect of managing project work on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya

### **Theoretical Review**

#### **Knowledge Management Theory**

Robert Grant (1996) proposed the knowledge management theory of. This theory is one of the most generally used models for explaining how information contributes to the accomplishment of organizational objectives, which frequently include gaining and maintaining competitive advantage (Grant, 1996). Today's productivity is reliant on workers' and managers' capacity to produce new information, learn, adapt, and take "smart" action (Tzortzaki & Mihiotis, 2014). These fresh insights are referred to as intellectual capital as a whole and are thought to belong only to the company that created them. Numerous studies have indicated that this intellectual capital is a crucial component of every firm's overall performance (Inkinen, 2015). Therefore, in order to facilitate the creation and administration of intellectual capital, organizations must work to establish knowledge management systems.

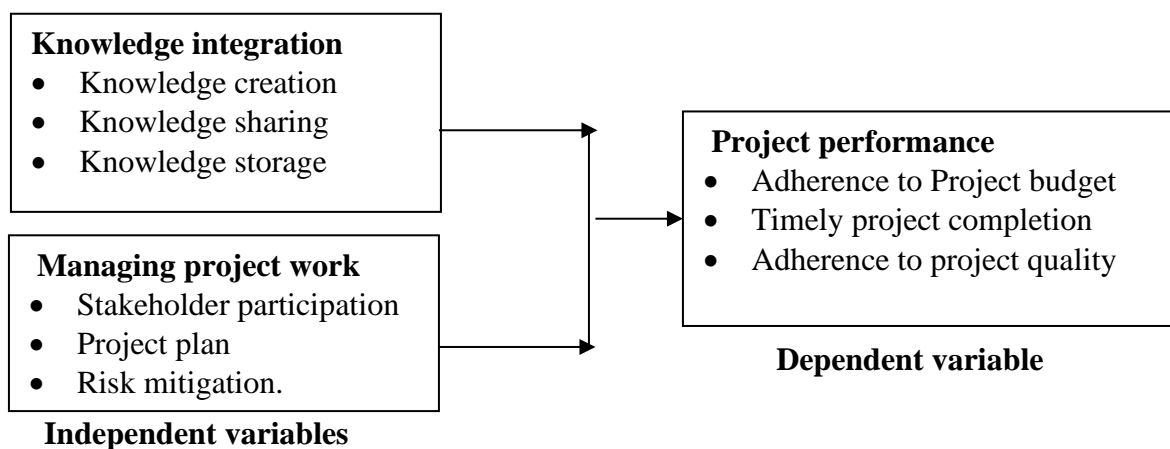
Malhorta (2001) argues that every new unit of knowledge applied successfully leads in a marginal gain in performance, in contrast to traditional factors of production that are controlled by diminishing returns. Since knowledge resources are difficult to duplicate and serve as the foundation for sustainable differentiation, Wiklund and Shepherd (2003) contend that they are particularly crucial for ensuring that competitive advantage is maintained. The creation, transfer, and transformation of knowledge into competitive advantage is the purpose of an organization. The theory offers advice on how project stakeholders should integrate knowledge in digitalized projects. Information is found, recorded, shared with project partners and stakeholders, applied to the project, and merged with other existing information. From the mistakes and issues encountered, new knowledge is produced, which is then preserved for usage in future projects. The theory supports the objective on knowledge integration.

### Resource- dependency Theory

Pfeffer and Salancik (1978) made advances in the resource-dependency hypothesis. The management of a firm's internal resources and capabilities is addressed by the resource-based view of the firm. The Resource Dependence Theory (RDT) is interested in how an organization's behavior is affected by how it uses external resources like raw materials. The ability of a business to acquire, transform, and utilize raw materials more quickly than rivals can be crucial to success, making the theory significant. RDT is based on the idea that having access to and having control over resources are the foundation of power and are necessary for the success of an organization. Solutions for preserving open access to resources must be well-thought-out because resources frequently fall under the control of entities other than the organization that requires them. Therefore, companies typically rely on their resource suppliers, which are typically other organizations, when they need to acquire resources that are essential to the performance of their activities. The project objectives and competitive advantage can be achieved with proper planning of the external resources. The theory supports the objective on Managing project work. The project manager is obliged to manage the project resources effectively to ensure that the quality projects are delivered on time and within set timelines.

### Conceptual Framework

A conceptual framework is a diagrammatic representation of the relationship between the study variables. According to Kothari (2018) the conceptual framework explains the relationship between the independent variables and the dependent variables. Figure 2.1 presents the conceptual framework.



**Figure 2.1: Conceptual Framework**

### **Integrating Project Knowledge**

Knowledge integration refers to the process of merging two or more originally unrelated knowledge structures into a single structure (Adenfelt, 2017). Cerchione and Esposito (2017) explained that there are many dimensions of KM. Some important and significant types are knowledge developing, knowledge sharing, knowledge storage, and knowledge utilization. The first important type of KM is knowledge generation or development. Knowledge generation is the process of creating and acquiring the information in a company and generating it within the boundaries of an organization (Ellemers, 2021). Individual knowledge is characterized by a high degree of self-organization, interdisciplinary, and communication orientation. In order to integrate the varying tasks into a busy and fragmented work schedule the knowledge worker constantly needs to evaluate the different, concurrent activities and coordinate them in an integrated workflow. The ability for self-organization is required from the individual knowledge workers. Knowledge workers frequently have to be experts in many fields. They need to be able to quickly acquire new skills when required and play different roles within the organization. Knowledge work often requires an active communication with other participants. There is a high need for communication with colleagues and the management and there is also an increased communication need with external participants such as customers, suppliers, and administrative office (Leistner, 2017).

Managerial knowledge is a manager's experience of creating and developing routines that is relevant to the challenge of new venture creation. Knowledge managers are those key individuals charged with the task of making knowledge management successful. Managerial competencies identification and its development are important tools of human resources management targeted at achieving the strategic goals of the organization. Managerial competencies thus become a key factor of success. Task knowledge is the means of describing a job in detail. Workers need to know what they are supposed to do in specific circumstances. This in turn increases both autonomy and initiatives by defining the latitude workers have. Supervisors need to know what their workers should be doing to provide feedback. It must be clear on what is being done and why (Hana & Jiri, 2022). All projects utilize a knowledge subset to produce the required deliverables. The project inherits a knowledge bank from its project team or organizational unit. Any further knowledge must be acquired throughout the project. And finally, the project must transfer the new knowledge back into the organization for use in future endeavors.

### **Managing Project Work**

Project planning describes the scope, key milestones and framework for managing the project including making adjustments to the scope or overlapping project phases (PMBOK, 2013). It is process which determines activities to be done, methodology, resources and timelines thus providing a roadmap for the project (Taylor, 2017). A project plan description is a detailed explanation of the steps necessary to complete a task. It includes a description of the tools and materials needed, as well as the sequence of steps to be followed (Habibi *et al.*, 2018). Kerzner (2022) argues that having a clear and concise task description is essential for successful project management, as it can help to avoid misunderstandings and confusion amongst team members. Furthermore, he states that a good task description should be specific, detailing what needs to be done and how it should be done. In addition, a task description should be kept as simple as possible so all team members can easily understand it.

A plan description is typically used in project management to help ensure that all team members know their roles and responsibilities and provide a clear and concise roadmap for completing the work. A well-written task description can also be used as a reference point during project execution to help ensure that the work is proceeding as planned. A plan specification is a document that outlines all of the necessary information regarding a specific task that needs to be

completed. This document serves as a guide for those who need to complete the task and includes details such as the task's purpose, what needs to be done to complete it, any necessary materials, etc. The purpose of a task specification is to provide a detailed description of the work to be completed as part of a project. This includes specifying the objectives, deliverables, milestones, and other relevant information. The task specification should be clear and concise so that everyone involved in the project understands what is expected of them. A well-written task specification can help to ensure that the project is completed on time and within budget. It can also help to avoid misunderstandings and disputes between the parties involved. A task specification should be reviewed and updated regularly as the project progresses to ensure that it remains accurate and relevant. A task analysis is breaking down a task into smaller, more manageable parts (Zwikael, 2019).

A task analysis aims to provide a detailed and structured breakdown of a task or activity to understand the individual steps and requirements involved. This understanding can then be used to improve performance through training or process improvement. Task analysis can be used for various tasks, including simple tasks like making a bed or more complex tasks like troubleshooting a computer problem. According to Irfan et al. (2021), the objective of project planning is to establish a project guideline with adequately to instruct the development team about the required operational packages that must be implemented and when the work must be completed, in addition to helping keep track of the overall project's progress and to retain the project record for future need. Moreover, Hamzeh et al. (2015) affirm that the goal of project planning is to ensure that the plan is feasible, and that the plan entails procedures that transform should-be-done project tasks into activities that can be accomplished.

## **Empirical Review**

### **Integrating Project Knowledge and Project Performance**

Choi and Lee (2019) conducted research to find out how IT support for Knowledge management affect team performance. The field study was conducted on two ICT firms in South Korea and involved 139 teams consisting of 743 individuals. The results indicated that whereas knowledge sharing had a positive impact on knowledge application, it did not show a direct impact on team performance. Therefore, knowledge sharing on its own is not enough, organizations must ensure such knowledge is applied to improve team performance and anchored by Information Technology systems. Oztekin et al. (2015) performed research to explore the impact of knowledge storage, on the financial and non-financial efficiency of service-based organizations in in Istanbul, Turkey. The researchers used a survey research approach and interviewed 83 managers from a population of 300 companies. Personal interviews were used to acquire data for the research. According to the findings, knowledge storage methods such as staff access to database, updates on database, and record keeping of corporate policies had a positive significant impact on performance of service-based organizations.

Ali, Musawir, and Ali (2018) investigated the effect of knowledge governance, knowledge sharing, and absorptive ability on project performance in project-based organizations (PBOs) in Pakistan's information and technology sector. 133 PBOs provided cross-sectional data on their projects. The partial least squares method was used to evaluate the data. According to the results, knowledge governance and knowledge sharing are primary determinants for increasing the project's absorptive capacity, which in turn enhances project performance considerably. Ogbonna (2020) sought to identify the barriers that staff members face when it comes to expressing their thoughts, abilities, and knowledge in order to avoid waste and complete effective projects in the public sector in Nigeria and Ghana. A sample of 13 public-sector project supervisors was collected. Semi-structured conversations were used to gather data. The results revealed three

obstacles to knowledge sharing: bureaucracy, misconduct, and allegiance to the parent organization. Mburia and Bett (2020) investigated the impact of knowledge management techniques on project success in Tharaka Nithi County, Kenya. The study used cross-sectional, explanatory, and descriptive research designs to identify 120 managers and staff in the study region. A census survey was conducted on all of the selected personnel. A questionnaire was used to gather primary data. The questionnaires were tested on 12 employees from nearby Embu County to ascertain their response rate. The research discovered that information sharing has an impact on project performance in Tharaka Nithi County.

### **Managing Project Work and Project Performance**

Ifran and Khan (2021) assessed the role of project planning on project success in the public sector. The study adopted a survey research design. The sample was 260 project engineers. Data was collected using questionnaires. Findings showed that planning has a significant positive impact on the success of public sector projects. Hubert (2018) sought to determine the influence of project planning on project performance in Rwanda. The researcher used a descriptive survey design on a sample size of 106 respondents. The findings established a positive significant correlation between project planning and project performance.

Atwa and Mudi (2019) examined influence of project planning on the performance of water supply projects in Kakamega County. The study utilized a descriptive research design and targeted a sample size of 128 respondents. The findings revealed that there was a positive relationship between project planning and the performance of water supply projects in Kakamega County. Rumenya and Kisimbi (2020) examined the influence of monitoring and evaluation systems on the performance of education projects in Mombasa County. The study conducted a descriptive research design on a sample size of 99 respondents. The study established that the performance of projects in the education sector significantly correlated with organizational structures for M&E, human resource capacity, and project M&E plan.

Nyakundi (2015) investigated the impact of project management processes on the outcomes of specific public-sector infrastructure projects at Telkom Kenya. The research used a descriptive survey research methodology. The said study's sample included 613 employees. The research sampled 83 people using stratified random sampling. Data was gathered using questionnaires. According to the results, project planning and initiation had a significant impact on project outcomes. Also, Mburu (2017) investigated the impact of project planning on the performance of road construction projects in Kenya. A descriptive research method was used in the research. Questionnaires were used to collect data. According to the findings, the lack of desirable performance of road projects in Kenya need to be handled by detailing project planning management methods.

### **RESEARCH METHODOLOGY**

The study adopted a descriptive survey design. According to Saunders, Lewis and Thornhill (2007), a descriptive design involves planning, organizing, collecting and analyzing of data so as to provide the information being sought. The study targeted five digitalized projects in three main telecommunication firms in Kenya which was the study unit of analysis. According to CCK, there are 12 main mobile money transfer projects implemented by the three telecommunication firms in Kenya. The mobile money transfer projects were the unit of analysis. The study targeted the key staff involved in implementation of the projects in the three main telecommunication firms in Kenya. The study unit of observation was 15 program managers, 70 project coordinators, and 180 project staff. The study sampling frame was 12 main mobile money transfer projects implemented by the three telecommunication firms in Kenya.

The sample size of 160 was determined using Yamane 1967 formula. The study used stratified random sampling technique. The respondents were stratified into three categories as indicated in the target table. Stratification ensures that every category in the target population has equal chances of participating in the study. The study used questionnaires to collect data.

A pilot study was conducted to pre-test questionnaires. The pilot study offers the researcher the chance to measure importance of the data by testing the reliability and validity of the questionnaires, to check the presentation of questionnaire, check that guidelines are understandable and making sure that statistics and analysis process is correct (Neff & Germer, 2013). Orodho (2009), a pre-test comprises of 10% of the sample size. Therefore, a pilot was conducted with 16 staff from the telecommunication firms.

The data was coded and entered to a computer for analysis using Statistical Package for Social Sciences (SPSS) Version 28 to enable generation of data. Data was analyzed using descriptive and inferential statistics and presented in tables. This study used correlation, and regression analysis. A strong high correlation implies that the study variables have a strong relationship while a small weak correlation means that the variables are not related. Multiple regression was used to establish how a unit change in the independent variable would predict changes in the dependent variable.

**DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION**

**Descriptive Statistics**

**Integrating Project Knowledge and Project Performance**

The first objective sought to examine the effect of integrating project knowledge on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya. Respondents were asked to indicate their level of agreement on the listed statements on effect of integrating project knowledge. Findings are presented in Table 1.

**Table 1: Integrating Project Knowledge and Project Performance**

Key: Strongly disagree (1), Disagree (2), Not Sure (3), Agree (4), Strongly agree (5).

Statements	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
The project staff are good time managers and meet targets on time	21	16.9	3	2.4	11	8.9	23	18.5	66	53.2	1.89
Project staff solve problems collaboratively	10	8.0	3	2.4	12	9.7	25	20.2	74	59.7	3.89
There are effective measures to manage project risks	62	50.0	28	22.6	6	4.8	18	14.5	10	8.1	1.96
Project leaders share tips on how to carry out project activities effectively	21	16.9	3	2.4	7	5.6	12	9.7	81	65.3	4.08
All tasks are duly allocated to staff according to their skills and ability	11	8.9	20	16.1	10	8.1	62	50.0	21	16.9	3.76
The project team is hired based on their skills and abilities	6	4.8	20	16.1	3	2.4	13	10.5	82	66.1	3.83
Project team meet informally and learn from one another	17	13.7	29	23.4	3	2.4	3	2.4	72	58.1	3.68
There is collaborative working among the project team	6	4.8	7	5.6	9	7.3	12	9.7	90	72.6	4.40

**N=124**



Findings show that the respondents strongly agreed that there is collaborative working among the project team (m=4.40). Respondents also agreed that project leaders share tips on how to carry out project activities effectively(m=4.08), project staff solve problems collaboratively (m=3.89), the project team is hired based on their skills and abilities (m=3.83), project team meet informally and learn from one another (m=3.68), and all tasks are duly allocated to staff according to their skills and ability (m=3.76). Respondents disagreed that there are effective measures to manage project risks (m=1.96), the project staff are good time managers and meet targets on time (m=1.89).

Findings imply that there is effective knowledge integration among the project team. The project managers have knowledge sharing which enables the staff to work collaboratively, hence promoting teamwork. The project leaders are also willing to share knowledge with the project team which ensures that tasks are implemented as guided by the supervisors. Roles are allocated to staff according to their skills and competencies which ensures that quality work is carried out. There is also effective conflict resolution among the project team members which enables them to accomplish tasks on time and delivery high quality projects. The project team also share knowledge among themselves during informal meetings. However, there is poor knowledge on risk management which may expose the projects to risks. There is also poor time management which may cause project delay. Findings agree with Ali, Musawir, and Ali (2018) that knowledge governance and knowledge sharing are primary determinants for increasing the project's absorptive capacity, which in turn enhances project performance.

**Managing Project Work and Project Performance**

The second objective aimed at assessing the effect of managing project work on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya. Respondents were asked to indicate their level of agreement on the listed statements on effect managing project work. Findings are presented in Table 2.

**Table 2: Managing Project Work and Project Performance**

Statements	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
Project schedule defines the period of the project	6	4.8	14	11.3	3	2.4	16	12.9	85	68.5	4.29
Project schedule ensures standardization of the project through documentation of policies and procedures	19	15.3	7	5.6	6	4.8	19	15.3	73	58.9	3.97
Work Breakdown Structure is well defined	22	17.7	10	8.1	4	3.2	17	13.7	71	57.3	3.85
Adequate human capital is allocated to every project prior to its commencement	56	45.2	39	31.5	3	2.4	6	4.8	20	16.1	1.85
Adequate resources are set aside for project implementation	82	66.1	18	14.5	4	3.2	13	10.5	7	5.6	2.25
Regular meetings are held with key project staff to track the progress of projects	4	3.2	6	4.8	3	2.4	16	12.9	95	76.6	4.55
The organization has put in place key risk management measures to avert project failures	76	61.3	21	16.9	7	5.6	3	2.4	17	13.7	1.90

N=124

Findings show that the respondents strongly agreed that regular meetings are held with key project staff to track the progress of projects (m=4.55), and project schedule defines the period of the project (m=4.29). Respondents also agreed that project schedule ensures standardization of the project through documentation of policies and procedures (m=3.97), and Work Breakdown Structure is well defined (m=3.85). Respondents disagreed that adequate resources are set aside for project implementation (m=2.25), the organization has put in place key risk management measures to avert project failures (m=1.90), and adequate human capital is allocated to every project prior to its commencement (m=1.85).

Findings imply that the projects are appropriately managed. The project schedule defines the project scope and there are regular meetings with the project staff to keep track of the project progress. There is an effective work breakdown structure which helps staff to understand their roles in the projects and helps to avoid role duplication. The respondents however feel that the resources allocated for the projects are not enough which may lead to project delays or abandonment. There is also a shortage of staff which may cause fatigue and low productivity. Poor risk management may put the staff and the project at risk causing project delays. Findings agree with Mburu (2017) that projects need to be handled by detailing project planning management methods.

**Project Performance**

The study sought to establish the performance rate of digitalized projects in telecommunications industry in Nairobi City County, Kenya. Findings are presented in Table 3.

**Table 3: Project Performance**

Statements	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
The digitalized projects are delivered on time	84	67.7	12	9.7	7	5.6	3	2.4	18	14.5	2.14
Projects are delivered within set budget	82	66.1	3	2.4	11	8.9	14	11.3	14	11.3	1.99
The projects meet the desired quality	17	13.7	6	4.8	6	4.8	13	10.5	82	66.1	3.47
Project beneficiaries are satisfied.	21	16.9	6	4.8	16	12.9	15	12.1	66	53.2	3.90

**N=130**

Findings show that respondents disagreed that the digitalized projects are delivered on time (m=2.14), and projects are delivered within set budget (m=1.99). Respondents agreed that the projects meet the desired quality (m=3.47), and project beneficiaries are satisfying (m=3.90). Findings show that although the projects meet the desired quality, they experience time and costs overruns. Findings concur with Lobute (2021) established that 53.7% of software projects in the telecommunications sector in Kenya fail, with mean time overrun of 27% and mean cost overrun of 33% with mean percentage of functionality delivered of 84%.

**Correlation Coefficient**

The researcher used the Karl Pearson’s coefficient of correlation (r) to show the relationship between the study variables. Absolute correlation coefficient (r) of 0.10 to 0.29 shows weak correlation, 0.30- 0.49 moderate, and 0.50 - 1.0 is considered strong (Wong & Hiew, 2005). The findings are as shown in Table 4.4:

**Table 4: Correlation Coefficient**

Variables		Project performance	project knowledge	Managing project work
Project performance	Pearson Correlation	1		
	Sig. (2-tailed)			
Project knowledge	Pearson Correlation	.904**	1	
	Sig. (2-tailed)	.000		
	N	124		
Managing project work	Pearson Correlation	.926**	.865	1
	Sig. (2-tailed)	.000	.000	
	N	124	124	

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

Findings show that integrating project knowledge and performance of digitalized projects was ( $r= 0.904$ ,  $p\text{-value}=0.000$ ) and correlation between managing project work and performance of digitalized projects was ( $r = 0.926$ ,  $p\text{-value}=0.000$ ). This shows that there is a strong significant relationship between integrating project knowledge and managing project work and performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya. Findings are in agreement with Niemelä (2022) that change management takes a key role in supporting the behavioral change of the project, Oztekin et al. (2015) that knowledge storage methods have a positive significant impact on performance, Ifran and Khan (2021) that planning has a significant positive impact on the success of public sector projects, and Ochenge (2018) that the tracking and assessment of projects have significant effect.

**Regression Analysis**

A regression analysis was conducted to determine whether changes in the independent variable would predict changes in the dependent variable. The study analyzed the variations of the performance of digitalized projects due to the changes in project integration management. The findings are presented in Table 5

**Table 5: Model Summary**

Model	R	r <sup>2</sup>	Adjusted r <sup>2</sup>	Std. Error of the Estimate
1	0.952	0.906	0.903	.146

*Predictors: (constant) integrating project knowledge and managing project work,*

Findings in Table 5, show that R squared was 0.906 implying that there was 90.6% influence of performance of digitalized projects due to the changes in integrating project knowledge and managing project work. This means that other project integration management practices that this study did not focus on contribute to 9.4% of performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya.

**Table 6: Analysis of Variance**

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	24.124	2	12.062	574.38	.000 <sup>b</sup>
	Residual	2.52	122	.021		
	Total	26.644	124			

*Predictors: (constant) integrating project knowledge and managing project work*

*Dependent variable: Project Performance*

The results in Table 7 show that the p-value obtained (0.000) was less than 0.05 an indication that the model was fit for predicting project performance. F calculated (574.38) was greater than the F critical ( $F_{(3,261)}$ ) which is 2.6. This shows that integrating project knowledge and managing project work were significant predictors of performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya

**Table 7: Regression Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	-.647	.173		-3.731	.000
Project knowledge	.302	.046	.420	6.585	.000
Manage Project work	.600	.070	.582	8.516	.000

As per the SPSS generated in Table 7,  
 Project performance =  $-0.647 + 0.302 X_1 + 0.600 X_2$

The equation above reveals that holding integrating project knowledge and managing project work at constant zero, the variables would significantly affect performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya as shown by constant  $\beta = -0.647$ .

Integrating project knowledge is statistically significant to performance of digitalized projects ( $\beta = 0.302$ ,  $t=6.585$ ,  $P = 0.000$ ). This shows that integrating project knowledge had significant positive relationship with performance of digitalized projects. Therefore, a unit increase in integrating project knowledge will result to increase in performance of performance of digitalized projects.

Managing project work is statistically significant to performance of digitalized projects ( $\beta = 0.600$ ,  $t=8.516$ ,  $P = 0.000$ ). This shows that managing project work had significant positive relationship with performance of digitalized projects. Therefore, a unit increase in managing project work will result to increase in performance of digitalized projects.

Findings imply that managing project work had the greatest effect on performance of digitalized projects in telecommunications industry in Nairobi City County, Kenya, followed by integrating project knowledge

**Conclusion**

Integration of knowledge in project management enhances project management. Knowledge sharing enables the staff to share knowledge, and which enhances job sharing and timely completion of tasks. Conflicts are also solved amicably which makes it easier to make project decisions and also creates a good working environment. The project managers have not been able to effectively manage project risks. Knowledge-sharing systems are useful for collecting and disseminating relevant information. Knowledge sharing involves management teams attending workshops to share knowledge on project management, project management teams arranging for stakeholder’s dissemination meeting to share knowledge on projects performance, project management teams holding internal meetings to train one another on project management.

Proper management of project work enhances project performance. This is achieved through effective project planning that has a clear project scope and work break down to guide the teamwork during project implementation. There is inadequate human and financial resource allocation which affects project performance. A well-defined project plan helps the project team to get a better understanding of the project. This helps to define the scope of the project and design objectives that are relevant, measurable, and achievable. A clear plan also clarifies the process and interventions that will lead to the project's outputs and deliverable. Flexible work schedules enable team members to have work-life balance and carry out their roles effectively as good planning ensures that there is no role ambiguity. Resources for managing projects are however inadequate.

### **Recommendations**

Project team members should not only share their own knowledge but also facilitate access to their informal knowledge networks and communities of practice. The project management team should be made up of members with varying years of experiences to share knowledge, continuous full-scale education, and further education. The firms should sponsor project team members to attend training on project planning, execution, monitoring, and evaluation. There should be a supportive organizational culture that encourages and rewards knowledge sharing.

Work breakdown structure should be well documented to guide the project activities. Project planning meetings should be held to ensure all project areas are covered during implementation including estimated time plan of starting and ending the project. Quality plans should be drawn showing the specifications at various points of the process. The specifications of the finished project should be clearly spelt out and a quality control mechanism put in place. The management should allocate adequate funding for project implementation. This will ensure that the resources required for the project activities are procured on time and the activities are not delayed.

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