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PROJECT PLANNING DEPENDENCIES AND PERFORMANCE OF VOICE INFRASTRUCTURE PROGRAM IN NAROK COUNTY, KENYA

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ABSTRACT

The general was to assess the effect of project planning dependencies on performance of voice infrastructure program in Narok County, Kenya. The specific objectives were to determine effect of planning dependencies; external dependencies, and discretionary dependencies on performance of voice infrastructure program in Narok County, Kenya. This study used descriptive research design. The study targeted the project supervisors and managers from the 5 companies that were contracted to implement the projects in the 8 locations hence the unit of observation was 160 respondents. This study adopted census by focusing on all 160 project senior staff who were representatives of both the project managers and project supervisors from the companies contracted to implement the voice projects. The study used questionnaires to collect data. The research instruments' validity and reliability was determined through pilot testing. A pilot was conducted with16 project management staff that were not included in the actual study. The study used content and construct validity. The researcher tested the reliability of questionnaires using Cronbach's Alpha Coefficient. Data was coded and then analysed using Statistical Package for Social Sciences (SPSS) computer software version 28. The study used both descriptive and inferential statistics. Findings were tabulated. Findings showed that; a strong significant relationship between external dependencies and project performance ($r=0.841$, $p=0.000$), and a strong significant relationship between discretionary dependencies and project performance ($r=0.878$, $p=0.000$). The recommendations are that; The organizations should strictly adhere to procurement laws and ethics which will ensure that the right process of selecting contractors are followed. Project managers should invest in Cargo tracking systems which will enable them to keep the materials on transit in real time. The project management should improve on ethics among the project team. The project team should be sensitized on the importance of confidentiality.

Key Words: Project Planning Dependencies, External Dependencies, Discretionary Dependencies, Voice Infrastructure Program, Narok County

Background of the Study

A project dependency is a task that relies on the completion of a different task. Various types of dependencies can be present between the projects. Detailed Planning is a key factor in project implementation. To ensure all work is completed on time and within budget, project managers should have a clear plan, giving details of who's responsible for what, what work is to be done, when it needs to be delivered and any other information. It's easier for people to get on with their work, when it is clear what's expected of them. Also, the schedule should have a measurement system of judging actual performance of the project against budget and time allowances (Bilgina & Eken ,2017).

Project management dependencies determine the order in which various activities should be completed. These dependencies are usually documented as an activity attribute and help in sequencing the activities on the project schedule network diagram. Dependencies between projects within a portfolio need to be taken into consideration since they may significantly affect the portfolio success with their combined effects. A discretionary dependency is a project activity that the project management team chooses after considering best practices, the team's knowledge, and the results of similar past projects. A discretionary action during a project's implementation may occur according to factors such as costs, safety, convenience, weather conditions, or the availability of specialist employees and contractors (Pashchenko, Plate, Ponta, Sabetta & Massacci, 2022). Project planners may consider discretionary project elements as providing some flexibility during their planning and as they implement a project. They're slightly more arbitrary tasks that can change in their completion and timing.

Voice infrastructure refers to the connection bandwidth that makes it possible for people to communicate with anyone in the world by transmitting voice. Quality and reliability are key factors in setting up voice infrastructure projects (Mathenge, 2016). The Kenya government under Communication Authority of Kenya, commenced to rollout communications infrastructure and services in unserved and underserved areas in the country to ensure universal access to ICT services by all in Kenya. The Cellular Mobile Network Infrastructure and Services Project, which commenced in the FY 2017/18 targeted to rollout mobile network infrastructure and services in unserved and underserved areas. Phase I of the project targeted 78 sub-locations, which were expected to be completed in the FY 2021/22. Phase II of the project, which commenced in the FY 2021/22 targeted to rollout mobile network infrastructure and services (3/4G) in 101 sub-locations in 17 Counties. Subsequent Phases of the project targeted 278 sub-locations in 25 Counties. Regarding the voice infrastructure program, CA identified sub-locations that are either unserved or underserved with communications services. The first phase of this project saw 78 sub-locations connected to mobile network and services with the second phase targeting 101 sub-locations. A third phase is planned to cover 67 sub-locations.

The Communications Authority of Kenya (CA) has awarded contracts to five companies to roll out telecommunications cellular mobile network infrastructure and services in 101 sub-locations across the country. The project is being implemented through the Universal Service Fund (USF). Safaricom PLC, Airtel Networks Kenya Ltd, American Towers Company (ATC) Kenya Operations Limited, Seal Towers Limited and Alan Dick & Company (East Africa) Limited were awarded the contract to roll out the infrastructure and services in the sub locations spread across 17 marginalized counties in Kenya. The sub locations are Turkana, Baringo, Elgeyo Marakwet, Garrissa, Isiolo, Samburu, Kajiado, Kilifi ,Kitui, Laikipia, West Pokot, Narok, Mandera, Tana River, Wajir, Lamu, and Marsabit Counties. The five firms beat 11 other firms in a competitive tendering process valued at Ksh 1.57 billion. With the additional 101-sub locations earmarked in the second phase, the Authority intends to narrow the gap of those unserved and under-served areas in Kenya by the year 2022.

Statement of the Problem

Kenya is the regional ICT hub of East Africa, with the country being a leader in broadband connectivity, general ICT infrastructure, value added services (VAS), mobile money, and mobile banking and FinTech services. The country's ICT sector is set to account for up to 7% of the country's GDP through IT-enabled services. To increase communication infrastructure in the country, the government allocated $132 million for ICT initiatives in the FY2022/2023 out of which $22.9 million was for the last mile connectivity network, $10 million for maintaining and rehabilitating the national optic-fiber backbone NOFBI phase II expansion cable; $11.8 million for installation and commissioning of fiber optic cable and, $2.6 million for the digital literacy program and ICT integration in secondary schools. According to the Kenya National Economic Survey report of 2019 the value of the ICT sector expanded by 12.9% from Ksh. 345.6 billion in 2017 to sh 390.2 billion in 2018, driven by growth in the digital economy. The country's telecommunications sector has registered double-digit growth in the last decade with a high penetration of 3G and 4G LTE coverage. Safaricom and Airtel have been testing 5G technology in 2021 however 5G uptake is expected to be slow due to high cost of infrastructure and consumer usage (ICT Authority Kenya, 2023). The ICT sector contributes to 8% of the GDP , creation of 180,000 direct jobs, has also enabled establishment of 55 ICT companies established which have a customer base of over 5 million, and increased public value of e-Government services with 50% of adults accessing at least one e-Government service (KNBS, 2022).

Despite the significance of the communication sector in the community, the companies have been facing challenging particularly in project performance. Namatsi and Muchelul (2021) found out that 50% of projects implemented by Safaricom experience time and budgetary while some have failed completely. In addition, most of the Safaricom bundles projects have been criticized by users whereby more that 80% of Kenyans have complained that the bundles get depleted easily which has made them shift to other affordable and efficient service providers. Voice infrastructure project is among the 68 voice projects implementation by the Communications Authority of Kenya (CAK). During the first phase of the voice project implementation in 2016, the project managers faced challenges leading to the delay in the completion of the projects in several areas, key among them being vandalism of the telecommunications infrastructure causing losses amounting to sh280 million. Another major challenge was lack of buy-in of the projects by the beneficiary local communities whereby some community members were not cooperative especially regarding erecting boosters in their land leading to delays in timely implementation of the projects (Cherono & Yatich, 2023). The Quality of Service Report for the year ended June 2023 released by CA shows that only Safaricom surpassed the 80 per cent performance threshold, after attaining 90 per cent of the set Key Performance Indicators (KPIs). Airtel and Telkom Kenya attained 79 per cent and 65 per cent respectively. Ochiel and Wandera (2020) found that 45% of the projects implemented by telecommunication firms in Kenya have failed and this was attributed to lack of training and development, poor communication and team work

The status of ICT access and use in Narok County is low, especially among households whereby approximately 34.3% of the population aged 3 years and above own a mobile phone which is lower than the national average of 47.3%. However, some users have reported that whenever they were browsing, they experienced network buffering (network was very slow to load pages or to download files). Approximately 50 persons experienced network buffering when using Safaricom's 4G network, 31 persons using Telkom's 4G network , and 3 persons experienced 4G network buffering provided by Airtel. In addition, 37 persons using Telkom's 4G network had their calls disconnected because of poor network, 13 persons using Airtel's network, five persons had the problem of call disconnection while using Safaricom network (KIPPRA, 2020).

There has been substantial interest in planning by scholars, especially in project management. Omonyo (2018) associated project performance with planning dependency. Tuyishime and

Nyambane (2021) study on project planning on project performance in public institutions found that setting objectives, targets, coordination of activities and mobilization of resources influences project performance. Delelegne (2016) assessed the role of project planning on project performance and found that human, management, technical and organizational factors influenced project performance. Wafula, Makokha, and Namusonge (2019) study on effect of project planning on performance of health construction projects in Trans-Nzoia County Kenya and found that project planning affects performance of CDF health facilities. There is however no study on project planning dependencies and performance of voice program in Kenya. This study hence sought to fill the research gap by assessing the effect of project planning dependencies on performance of voice infrastructure program in Narok County, Kenya.

Specific Objectives

i. To establish the effect of external dependencies on performance of voice infrastructure project in Narok County, Kenya.
ii. To examine the effect of discretionary dependencies on performance of voice infrastructure project in Narok County, Kenya.

LITERATURE REVIEW

Theoretical Review

Resource Dependency Theory

The theory was developed by Pfeffer and Salancik (1978). The theory explains how organizations' behaviour is affected by the external resources they possess. Resource dependency theory is based on the principle that an organization, such as a business firm, must engage in transactions with other actors and organizations in its environment in order to acquire resources. Although such transactions may be advantageous, they may also create dependencies. The main concern of management is that a variety of resources taken from the environment of an organization must be put to best use in order for the organization to survive in a demanding and changing environment. Thus, an organization's survivability depends upon its ability to extract resources from its environment. By coping well with the many constraints and uncertainties during the process of extracting resources from the environment (Thompson, 1967), an organization can elevate its existing system capacity and transform itself into a more sophisticated system capable of handling tasks that are more complex (Hong, 2002; Kearns and Lederer, 2004; Swanson, 1985).

The fundamental assumption of the Resource Dependence Perspective is that overall resources are limited, and the survival and prosperity of a given organization relies on input from other organizations. Organizations do not have sufficient resources to be independent and, therefore, must form coalitions to survive (Yuchtman & Seashore, 1967). This perspective explains why RDP considers organizations as coalitions of internal and external groups seeking mutual benefit. The more an organization depends on the limited resources from the external settings, the higher is its instability. Necessary resources, new technologies, accumulated expertise and experiences need to be integrated in order to overcome this instability. Consequently, the more it depends on the resources from the environment, the higher the rate of interactions between the organization and its environment (Laumman et al., 1978; Pfeffer and Nowak, 1976). However, the environment does not bind organizations passively. Organizational systems should act proactively to manage the environmental conditions. The theory supports the third objective on external dependencies. This theory guides on external resources that are necessary to effectively implement the projects. These are the resources that are not available internally and must be outsourced. The resources may include technology, manpower or gadgets that may not be available in the company.

Descriptive Decision Theory

Descriptive Theory was formulated by Leonard Savage's (1954). Decision theory is the study of how people model "judgement" and from that how they determine their choice. These may be probability-based models, loss functions models or other forms of statistical representations of judgements. Much of decision theory concentrates on 'how decisions are actually made' based on observation of previous decisions. There is a strong body of evidence that the predicted rational models are rarely observable in practice. What people should do in theory is often very different from the final decision. This might be because the original predictive model was erroneous or that it failed to encompass the whole thought process which influenced the final decision. The normative direction in decision theory focuses on providing guidance on how to solve decision-making problems, what procedures and models to use for each type of decision-making situation in order to achieve the required quality of decision-making processes. According to Bačová (2007), normative decision-making models have long been recognized as a measure, criterion, standard against which the degree of "rationality" of individual and group decisions is compared and evaluated. This plays an important role in the eyes of many managers.

Descriptive decision theory seeks to guide decision makers toward consistent, rational choices, while recognizing their cognitive limits. They use descriptive theories of how people 'do' make decisions to understand people's cognitive processes, while using normative theories of decision making as the ideal way to make decisions. Prescriptive theories try to help people to analyse their decisions in the correct way and make rational choices (Bell et al, 1988). Descriptive theory guides a project manager on which project information to share with stakeholders and the information to keep discrete. This will ensure that crucial information is not leaked to people who may hinder project performance.

Conceptual Framework

The conceptual framework shows the relationship between independent and dependent variables. The independent variables are; external dependencies, discretionary dependencies. The dependent variable is performance of voice infrastructure program in Narok County, Kenya.

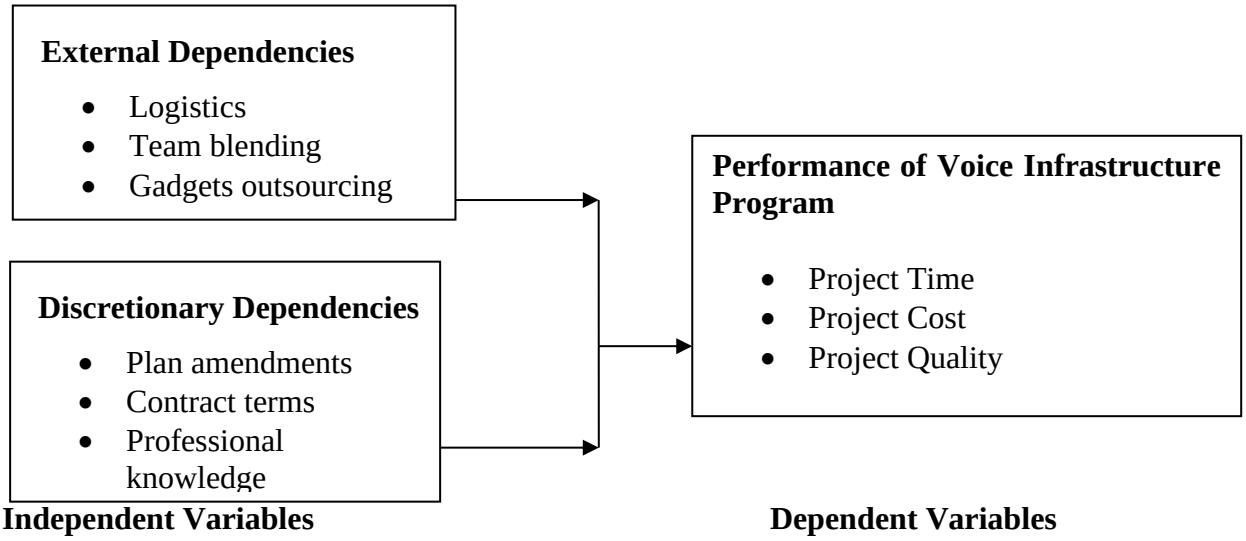

Figure 2.1: Conceptual Framework

External Dependencies

Cleden (2017) argues that, among the various project dependencies, external factors play a pivotal role in shaping the success of performance programs. External dependencies refer to relationships, connections, or constraints between a project and factors outside the direct control of the project

team. According to Martinsuo and Geraldi (2020), external dependencies can arise from various aspects outside the project's scope, and they often require collaboration, coordination, or alignment with external stakeholders, entities, or systems. The Council of Supply Chain Management Professionals (CSCMP, 2016) define logistics management as the complex network of processes involved in procuring, transporting, and managing resources and materials needed for project execution. External dependencies related to logistics can arise from supply chain challenges, transportation delays, or inadequate inventory management. These dependencies hold the potential to disrupt project schedules, leading to bottlenecks and resource shortages. According to Yawar and Seuring (2017), addressing logistics dependencies necessitates strategic planning that considers the optimal distribution of resources and anticipates potential challenges in the supply chain. Integrating logistics into project planning ensures that resources are available when needed, mitigating disruptions and enhancing overall project efficiency.

Team blending involves the collaboration of diverse individuals from different departments, disciplines, or organizations in a cohesive manner. According to Demirkesen and Ozorhon (2017), staff integration arise from the need to harmonize varied skill sets, communication styles, and work cultures. Mismanaged team blending dependencies can lead to miscommunication, conflicts, and suboptimal teamwork. Malik et al. (2021) adds that performance programs prioritize effective team integration by fostering open communication, cultural sensitivity, and shared objectives. Addressing team blending dependencies enhances project synergy, innovation, and the collective capacity to tackle challenges. Pererva et al. (2021) relates outsourcing to the practice of acquiring necessary tools, machinery, or technology from external vendors. External dependencies related to equipment outsourcing can materialize in the form of delivery delays, technical issues, or unexpected maintenance requirements. These dependencies directly impact project execution, especially in sectors reliant on specialized equipment. For example, Cruz and Haugan (2019) observed that service outsourcing for advanced healthcare equipment has significantly increased recently, increasing from a revenue of US$10 to US$399.91 billion. Performance programs must carefully evaluate potential vendors, establish clear terms, and account for contingencies. Integrating equipment outsourcing dependencies into project planning ensures the timely availability of essential tools, minimizing disruptions and optimizing resource utilization.

Discretionary Dependencies

Discretionary dependencies emerge as a vital aspect of ensuring the success of performance programs. According to Oburu (2020), discretionary dependencies, also known as soft dependencies or preferential dependencies, are relationships between tasks, activities, or elements within a project that are not mandatory or inherently sequential. Unlike mandatory dependencies, which must be followed due to external constraints, discretionary dependencies provide flexibility for project teams to choose the order in which certain tasks are executed. According to Doğan and Helvacioğlu (2017) discretionary dependencies reflect the project team's decisions about the most efficient or effective way to sequence tasks, taking into account their expertise, experience, and knowledge of the project context. Similarly, Le Tellier et al. (2019) states that discretionary dependencies are based on preferences and enable project managers to organize the work in the most efficient ways. Also, they allow for some degree of freedom in deciding the order in which tasks are performed, as long as the overall project goals are met.

Kerzner (2017) define plan amendments as deliberate changes or adjustments made to the project plan based on evolving circumstances, feedback, or new insights. According to the researcher, these changes can take place at any point in a project's lifespan and result in trade-offs between the project's requirements in terms of cost, time, and performance. Discretionary dependencies tied to plan amendments recognize that adaptability is often critical for project success. Projects can encounter unforeseen challenges or opportunities that necessitate modifications to the original

plan. Effective performance programs embrace plan amendments as a discretionary dependency, enabling project teams to respond proactively to changing conditions. As a result, organizations ensure that projects remain aligned with goals, even in the face of uncertainty by integrating plan amendments into project planning (Kerzner, 2017). According to Wideman (2022), contractual arrangements acknowledge that contracts often provide a framework for project execution but may not anticipate all scenarios. Contractual agreements can be influenced by changes in scope, resource availability, or unforeseen challenges. According to Hertogh and Westerveld (2010), large-scale building projects are defined by extensive contractual arrangements involving several players who are connected by a chain of relationships, agreements, and contract provisions in order to provide the service as planned. Projects can navigate changes while maintaining collaboration and trust by recognizing the potential for evolving contract terms.

According to Bals et al. (2019), professional knowledge encompasses the expertise, insights, and judgment of project team members. Discretionary dependencies tied to professional knowledge acknowledge that decisions often require specialized insight. The discretionary aspect lies in the fact that project teams can leverage their expertise to make informed choices that optimize project outcomes. Performance programs must foster a culture that values and integrates diverse professional perspectives. Embracing professional knowledge as a discretionary dependency ensures that project decisions are well-informed and aligned with the project's goals and requirements. According to Le Tellier et al. (2019), discretionary dependencies wield considerable influence over the trajectory of performance programs. Recognizing the discretionary nature of plan amendments, contract terms, and professional knowledge enhances a project's ability to navigate challenges, seize opportunities, and optimize resource utilization. Neglecting or suppressing these dependencies can limit a project's adaptability and hinder its ability to achieve success in dynamic environments (Oburu, 2020). Conversely, embracing these dependencies equips projects with the resilience and responsiveness required to thrive.

Empirical Review

External Dependencies and Project Performance

Kuthyola, Liu, and Klein (2017) sought to investigate the relationship between interdependent tasks, team effectiveness, and project management success in Taiwan. 300 software professionals completed a questionnaire for the study. The findings demonstrated how several teamwork quality factors mediated the significant relationship between task interdependence and project effectiveness. Yap, Leong, and Skitmore (2020) examined factors affecting team dynamics and how they might be improved for enhanced teamwork in Malaysia. Data on construction professionals from client, consultant, and contractor organizations was gathered using a survey questionnaire with 10 collaboration-related features and 25 teamwork traits. The results showed that effective team leadership, clearly established team obligations, distinct team goals and objectives, and strong interaction amongst all project managers are the most important characteristics determining project performance.

Zhu et al. (2017) sought to investigate how contracted management process affected both basic and advanced outsourcing processes using publicly traded Chinese businesses. The research established the proposed framework based on questionnaire responses gathered from 250 subsidies by using resource-based viewpoints. The findings showed that the two forms of logistics outsourcing are affected by the outsourced management process in various ways. Unlike advanced outsourcing, which interacts with the outsourcing management procedures, basic logistics outsourcing directly affects project cost and delivery. Uwamahoro Kayumba (2019) investigated the effect of outsourcing on project performance in Rwanda. Three representative firms from the production and telecom industries were identified. Convenient and purposeful sampling was used to choose a sample of 111 respondents. Primary data was gathered through questionnaires while secondary data was obtained from documentation. The results showed that

Rwandan businesses outsource to gain specialized knowledge and cut expenses. According to respondents' opinions on the impact of outsourcing on cost effectiveness, productivity, and profitability, the results also showed that outsourcing operations contributed to project performance.

Kasimu et al. (2017) studied the relationship between team communication and success of projects in Uganda's public universities. 150 state and sponsored projects from 5 public institutions made up the research's sample. The research employed a cross-sectional survey approach. A total of 127 projects were included in the sample using a stratified sampling technique. The findings showed that clear project's goal and efficient team communication contribute to successful teamwork and project performance. Kyusa (2015) looked on how the Kenyan shipping sector's operational effectiveness was impacted by logistics outsourcing. The research was conducted using census data and used a sample of 42 shipping businesses in Kenya according to the KSAA, 2015. The results demonstrated that organizations decided to outsource their services so they could concentrate on their core capabilities. Additionally, shipping companies adopted logistics outsourcing practices to enable them concentrate on the long-term survival of the business because it helped them boost project productivity, lower lead times, and save on expenses. Mulama (2012) investigated how large manufacturing enterprises' projects performed when adopted outsourcing logistics techniques in Kenya. The population included all Nairobi's large-scale manufacturing enterprises. The sample size was established using stratified random sampling research methods. The research showed that businesses outsourced material handling, warehousing, and transport management. The organizations outsourced since it allowed them to focus on their essential deliverables including quality, reduced costs, and time efficiency.

Discretionary Dependencies and Project Performance

Klijn and Koppenjan (2016) conducted study on the key elements of public-private partnership contracts in the Netherlands to investigate their influence on project performance. Participants included project leaders and officials from the public sector, as well as members of commercial groups or consultants working on public-private partnership projects. 144 respondents completed the survey form. The findings showed that the potential for applying sanctions on contracts was the only element thought to have a substantial effect on a project's perceived performance. Jagtap and Kamble (2020) investigated how the relationship between the client and the contractor affected project performance in construction sector in India. Purposive sampling was used to gather the data from 346 construction industry experts working on projects in India. The results showed that contractor cooperation and their calculative commitment to relationships were significant factors that indirectly impacted project performance. El-khalek et al. (2019) sought to identify, examine, and rank the most crucial factors that affect the choice of a subcontractor in Egyptian construction projects. The study used a statistical analytic technique. 120 firms were selected at random and directed to complete a pre-made questionnaire. Email distribution and in-person interviews with the target group were used to distribute the questionnaire. According to the findings, factors that most influenced project performance were contract terms like timely delivery of supplies, inability to execute the contract due to financial issues, challenges in reimbursing subcontractors and bidding pricing.

Wachira, Gakure, and Orwa (2012) sought to understand how managers perceived the knowledge and abilities of human resource development specialists in terms of their ability to support their effective growth In Kenya. The research utilized a descriptive survey approach with 205 managers from all 42 government agencies as its target population. It adopted both stratified random and simple random samplings. A questionnaire was used to gather the data. According to the findings, most managers considered human resource development specialists to be less knowledgeable in project implementation operations. Kemei, Oboko, and Kidombo (2018) examined key success factors in connection to enterprise resource planning (ERP) project performance from Kenyan

Energy Sector State Parastatals and the project manager's leadership ability. 144 participants provided data via questionnaires at their respective organizations. Data from the Heads of ICT was gathered using a key informant interviewing guide. Mixed methodologies were used. According to the study's findings, managerial support has a beneficial impact on the association between project manager leadership skills and the success of ERP system projects.

RESEARCH METHODOLOGY

This study used a descriptive research design. This study target population was the voice projects in Narok County. According to the Communication Authority of Kenya (CAK), there were 66 projects under the voice program initiated across 17 counties in Kenya. Out of the 66 locations for the voice projects, the majority (8) were in Narok County. The 8 locations are Maji-Moto, Enkutoto, Entasekera, Olngarua, Olmesutie, Mausa, Olorte, Elangata Enterit. The projects were contracted to 5 communication companies: Safaricom PLC, Airtel Networks Kenya Ltd, American Towers Company Kenya Operations Limited, Seal Towers Limited and Alan Dick East Africa Limited. The 8 projects were the study unit of analysis. The study targeted the project supervisors and managers from the 5 companies that were contracted to implement the projects in the 8 locations hence the unit of observation was 160 respondents. This study adopted a census technique. This research used a questionnaire to collect primary data. The research instruments' validity and reliability will be determined through pilot testing. A pilot was conducted with 10% of the unity size as recommended by Kothari (2013). The pilot was hence conducted with 16 project management staff that will not be included in the actual study. The pilot test respondents were sampled from the 5 communication companies that implement the voice programs in the various stations in Kenya. Qualitative was coded and then analyzed using Statistical Package for Social Sciences (SPSS) computer software version 28. The study used descriptive and inferential statistics. Descriptive statistics were used to analyze the data in frequency distributions and percentages which were presented in tables. Presentations of the analyzed data was done in tables. The study also used correlation and multiple regression analysis to test the relationships between the variables.

RESEARCH FINDINGS AND DISCUSSIONS

The sample size of study was 160 and it comprised of project supervisors and managers from the 5 companies that were contracted to implement voice projects. The questionaries were administered to 144 respondents and 118 were successfully answered. This represents an 82% response rate which is in line with the recommended response rate as recommended by Kothari (2012) that a response rate of more than 50% is adequate and response rate of more than 70% is considered excellent.

External Dependencies

The first objective sought to establish the effect of external dependencies on performance of voice infrastructure project in Narok County, Kenya. Respondents were asked to indicate the extent to which they agreed on statements related to external dependencies. Findings are presented in Table 1.

Table 1: External Dependencies

Key; 1- strongly disagree (**SD**), 2-disagree (**D**), 3-Neutral (**N**), 4-agree (**A**), 5-strongly agree (**SA**)

Statements	SD		D		N		A		SA		M
	F	%	F	%	F	%	F	%	F	%	
There are proper transportations structures for the project materials	13	11.0	77	65.3	3	2.5	9	7.6	16	13.6	2.13
The project leaders ensures that there is a secure warehouse to store the project materials to ensure work flow	15	12.7	8	6.8	6	5.1	18	15.3	71	60.2	4.03
There is team work among the project team	20	16.9	10	8.5	3	2.5	22	18.6	63	53.4	3.83
The project leaders encourage knowledge sharing among project team members	15	12.7	9	7.6	3	2.5	44	37.3	47	39.8	3.84
There is consultation with the voice service providers during project implementation	10	8.5	14	11.9	3	2.5	19	16.1	72	61.0	4.09
The project leaders outsource gadgets from the voice providers	5	4.2	10	8.5	3	2.5	13	11.0	87	73.7	4.42

N=118

Findings show that the respondents strongly agreed that the project leaders outsource gadgets from the voice providers (M=4.42). Respondents also agreed that ; the project leaders ensures that there is a secure warehouse to store the project materials to ensure work flow (M=4.03), there is consultation with the voice service providers during project implementation (M=4.09), there project leaders encourage knowledge sharing among project team members (M=3.84), and there is team work among the project team (M=3.83). Respondents disagreed that there are proper transportations structures for the project materials (M=2.13).

The findings indicate that the organizations partner with suppliers to ensure that all gadgets needed for the projects are availed. The organizations have secure warehouse that help to minimize vandalism of project materials. Availability of materials ensures work flows and implementation of projects within set timelines. The project managers also consult with voice providers since they are the providers of telecommunication services and their support is crucial or desirable project performance. The project managers support knowledge sharing among the project team which enables team members to share knowledge and skills that may help to achieve project success. There is however a challenge in transportation of the project materials which may cause material damage and possible losses. Yap, Leong, and Skitmore (2020) that effective team leadership, clearly established team obligations, distinct team goals and objectives, and strong interaction amongst all project managers are the most important characteristics determining project performance.

Discretionary Dependencies

The second objective aimed at examining the effect of discretionary dependencies on performance of voice infrastructure project in Narok County, Kenya. Respondents were asked to indicate the

extent to which they agreed on statements related to discretionary dependencies. Findings are presented in Table 2.

Table 2: Discretionary Dependencies

Key; 1- strongly disagree (**SD**), 2-disagree (**D**), 3-Neutral (**N**), 4-agree (**A**), 5-strongly agree (**SA**)

Statements	**SD**		**D**		**N**		**A**		**SA**		**M**
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	
The project team members adhere to confidentiality when handling project plans and designs	10	8.5	16	13.6	3	2.5	21	17.8	68	57.6	4.03
Project changes are only shared with key project team members	11	9.3	16	13.6	11	9.3	45	38.1	35	29.7	3.65
The contract terms are strictly accessible by the contractor and the government	17	14.4	6	5.1	6	5.1	26	22.0	63	53.4	3.95
The company takes time to read through the contract before signing	15	12.7	7	5.9	9	7.6	27	22.9	60	50.8	3.93
The professional knowledge of the project team members is not disclosed to other contractors	13	11.0	16	13.6	6	5.1	14	11.9	69	58.5	4.07
Project details are shared privately to the projects teams through personal email/text	24	20.3	9	7.6	6	5.1	6	5.1	73	61.9	3.81

N=118

Findings show that project managers agreed that; the professional knowledge of the project team members is not disclosed to other contractors (M=4.07), the project team members adhere to confidentiality when handling project plans and designs (M=4.03), the contract terms are strictly accessible by the contractor and the government (M=3.95), the company takes time to read through the contract before signing (M=3.93), project details are shared privately to the projects teams through personal email/text (M=3.81), and project changes are only shared with key project team members (M=3.65).

Findings imply that the projects managers observe ethical leadership. The professional knowledge of the project team members is not disclosed to other contractors. This may promote retention of the project team since it may reduce poaching of the project team members by other contractors. The project team members are advised on the importance of confidentiality when handling project plans and designs since it ensures that there is no interference of the project plans. Project details are also shared among the project team to avoid information leakage. Findings are in agreement with Kemei, Oboko, and Kidombo (2018) that managerial support has a beneficial impact on project performance.

Project Performance

The project managers and supervisors were asked to indicate the extent to which they agreed on statements related to project performance. Findings are presented in Table 4.7.

Table 3: Transaction Transparency

Key; 1- strongly disagree (**SD**), 2-disagree (**D**), 3-Neutral (**N**), 4-agree (**A**), 5-strongly agree (**SA**)

Statements	**SD**		**D**		**N**		**A**		**SA**		**M**
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	
Projects were completed within the set budget	77	65.3	11	9.3	6	5.1	3	2.5	21	17.8	2.02
Projects were completed on time	76	64.4	3	2.5	9	7.6	16	13.6	14	11.9	2.06
Projects meet desired quality	14	11.9	21	17.8	6	5.1	37	31.4	40	33.9	3.42
There was less complaints from project beneficiaries	17	14.4	10	8.5	6	5.1	10	8.5	75	36.6	3.87

N=118

Findings show that the project managers disagreed that the projects are delivered on time (M=2.02) and projects were completed within the set budget (M=2.06). Respondents agreed that Projects meet desired quality (M=3.42) and there was less complaints from project beneficiaries (M=3.87). Findings imply that the projects face time and budget constraint. They project managers however delivery quality projects and the beneficiaries are satisfied. Findings concur with Namatsi and Muchelul (2021) that 50% of projects implemented by Safaricom experience time and budgetary while some have failed completely.

Coefficient of Correlation

Karl Pearson's coefficient of correlation (r) was used to determine the relationship between the study variables. Correlation was significant at <0.005 and a correlation of <0.3 shows weak correlation, 0.31-0.49 moderate correlation while >0.5 shows a strong correlation. Correlation results are shown in Table 4

Table 4: Coefficient of Correlation

		Performance	external dependencies	discretionary dependencies
	Variables			
Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
External	Pearson Correlation	.841**	1	
	Sig. (2-tailed)	.000		
Discretionary	Pearson Correlation	.878**	.980	1
	Sig. (2-tailed)	.000	.000	

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

According to findings in Table 4, there is a strong significant relationship between external dependencies and project performance (r=0.841, p=0.000), and a strong significant relationship between discretionary dependencies and project performance (r=0.878, p=0.000). Findings are in support of; Kuthyola, Liu, and Klein (2017) that teamwork quality factors significantly affect project performance, and Jagtap and Kamble (2020) that contractor cooperation and

their calculative commitment to relationships were significant factors that impacted project performance.

Regression Analysis

The study analyzed the variations of changes in project performance due to changes in external dependencies, discretionary dependencies. Table 5-7 presents the regression results

Table 5: Model Summary

Model	R	r^2	Adjusted r^2	Std. Error of the Estimate
1	0.910	0.829	0.823	.644

Predicators: (constant) external dependencies, discretionary dependencies

The study used the coefficient of determination to evaluate the model fit. The model had an average adjusted coefficient of determination (R2) of 0.829 and which implied that 82.9% of the variations in program performance are explained by the independent variables under study (external dependencies, discretionary dependencies). Therefore, other project planning dependencies that were not included in the study contributed to 17.1%of changes in program performance.

Table 6: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	227.100	4	56.775	136.891	.000[b]
	Residual	46.866	113	.415		
	Total	273.966	117			

Predicators: (constant) external dependencies, discretionary dependencies
Dependent variable: Project Performance

From the ANOVA statics, the study established the regression model had a significance level of 0.00% which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5% (0.05). The calculated value was greater than the critical value (136.891>2.50) an indication that external dependencies, discretionary dependencies all have a significant effect on program performance.

Table 7: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant/Y Intercept	4.808	.247		19.455	.000
External dependencies	.664	.221	.620	3.005	.003
Discretionary dependencies	1.827	.220	1.731	8.266	.000

As per the SPSS generated in Table 7,

Program performance = 4.808 + 0.664 (external dependencies) +1.827(discretionary dependencies

External dependencies is statistically significant to program performance ($\beta = 0.664$, t=3.005, P = 0.000). This shows that external dependencies had significant positive relationship with program performance. This implies that a unit increase in external dependencies will result to increase in performance of voice infrastructure program.

Discretionary dependencies is statistically significant to program performance ($\beta = 1.827$, t=8.266, P = 0.000). This shows that discretionary dependencies had significant positive relationship with

program performance. This implies that a unit increase in discretionary dependencies will result to increase in performance of voice infrastructure program.

Conclusion

There is effective project team leadership that enhances project performance. The project leaders collaborate with material and service providers to ensure quality projects are delivered. The gadgets are outsources from voice providers since they are experienced management of communication projects. They are hence aware of the most suitable and high quality products used in communication projects. The managers have also ensured that there are adequate project materials and they are secured to ensure work flow. The leaders further support and encourage the project team members to share knowledge which enhances job sharing and saving project time. The transportation structures are however considered faulty that may lead to late delivery or materials or breakages of delicate materials.

Project managers take measures to protect the project information. This is achieved through ensuring that the project team members adhere to confidentiality when handling project plans and designs. The project details are also shared with project members in confidentiality. This ensures that the project plans are not shared with other third parties that may be a threat to project implementation. The managers also ensure that the contractors strictly adhere to the terms of the contract to ensure that projects are implemented as per the agreed terms and conditions. The project change are only shared with key project team members which is an indication that some key project stakeholders may be excluded from the planned project changes.

Recommendations

The organizations should improve on logistics managements. They should invest in Cargo tracking systems which will enable them to keep the materials on transit in real time. They will hence be able to update the project team on site. The project managers should also outsource materials that are rare. This will ensure that the materials are availed on time and will also help to diversify risks that may accrue from external sources.

The project management should improve on ethics among the project team. The project team should be sensitized on the importance of confidentiality. This will ensure that the secrets on projects are retained among the project team. The project changes should also be shared not only with the project team but with stakeholders to avoid rejection of project changes and conflicts that may arise especially if the stakeholders feel that some of the changes do not suit their needs.

Areas for Further Study

A study incorporating other project planning dependencies variables that may contribute to 17.1% of performance of voice program as the study has shown that the four project planning dependencies variables contribute to 82.9% of voice program performance. A similar study may be conducted in another county since the current study was conducted in one counties that were targeted the communications authority targeted.

REFERENCES

Buertey, J. I. T., Amofa, D., & Atsrim, F. (2016). Stakeholder management on construction projects: A key indicator for project success. *American Journal of Civil Engineering*, *4*(4), 117-126.

Burman, L., & Dadoun, N. (2016). Managing Dependencies and Uncertainties in Multi-Project Organizations Using Management Control Systems: A Case Study at Saab Combat Systems. Master of Science Thesis. Stockholm Sweden.

Cherono, C. & Yatich, M. 2023). Universal Service Fund Projects Set To Boost Connectivity In Banditry Prone Areas. https://www.kenyanews.go.ke/universal-service-fund-projects-set-to-boost-connectivity-in-banditry-prone-areas/

Cleden, D. (2017). *Managing project uncertainty*. Routledge.

Council for Supply Chain Management Professionals. (2016). *CSCMP Supply chain management terms and glossary*. http://cscmp.org/imis0/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921

Cruz, A. M., & Haugan, G. L. (2019). Determinants of maintenance performance: A resource-based view and agency theory approach. *Journal of Engineering and Technology Management*, *51*, 33-47.

Delelegne, S. (2016). *Assess the Role of Project Planning on Project Performance in Ethiopia.* Unpublished Masters Thesis, Addis Ababa University.

Demirkesen, S., & Ozorhon, B. (2017). Impact of integration management on construction project management performance. *International journal of project management*, *35*(8), 1639-1654.

Famiyeh, S., Amoatey, C. T., Adaku, E., & Agbenohevi, C. S. (2017). Major causes of construction time and cost overruns: A case of selected educational sector projects in Ghana. *Journal of Engineering, Design and Technology*, *15*(2), 181-198.

Hang, N. T. (2020). Research function of planning in administrative works at modern offices. *The USV Annals of Economics and Public Administration*, *20*(1 (31)), 235-242.

Hertogh, M., & Westerveld, E. (2010). Playing with Complexity. Management and organisation of large infrastructure projects.

Kemei, D., Oboko, R., & Kidombo, H. (2018). The influence of top management support on the relationship between project manager leadership competencies and ERP system project performance: Findings from Kenya energy sector. *International Academic Journal of Innovation, Leadership and Entrepreneurship*, *2*(2), 195-210.

Kerzner, H. (2017). *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.

Klijn, E. H., & Koppenjan, J. (2016). The impact of contract characteristics on the performance of public–private partnerships (PPPs). *Public Money & Management*, *36*(6), 455-462.

Kopańska, A. (2019). *External evaluation of 4 pilot actions: Evaluation of the RESTAURA project documentation-summary*. Interreg Central Europe, Restaura.

Kuthyola, K.F., Liu, J.YC. & Klein, G. (2017). Influence of Task Interdependence on Teamwork Quality and Project Performance. In: Abramowicz, W. (eds) Business Information Systems. *Lecture Notes in Business Information Processing*, 288. Springer, Cham.

Malik, M., Sarwar, S., & Orr, S. (2021). Agile practices and performance: Examining the role of psychological empowerment. *International Journal of Project Management*, *39*(1), 10-20.

Martens, M. L., & Carvalho, M. M. (2016). The challenge of introducing sustainability into project management function: multiple-case studies. *Journal of Cleaner Production*, *117*, 29-40.

Martinsuo, M., & Geraldi, J. (2020). Management of project portfolios: Relationships of project portfolios with their contexts. *International Journal of Project Management*, *38*(7), 441-453.

Mwendwa, N. K. (2017). Availability of resource materials and facilities for ICT integration in the public Primary School Curriculum in Kitui County, Kenya. *Saudi Journal of Humanities and Social Sciences*, *2*, 362-368.

Namatsi, P., & Muchelule, Y. (2021). Effect of agile project management on project success in private firms in Kenya. *The Strategic Journal of Business & Change Management*, 8 (1), 289 – 301.

Owuor, F., Kwakha, O., & Ongaro, F. (2022). Project Planning as an Instrument for Performance of Universal Service Projects in Kenya. East African Journal of Business and Economics, 5(2), 27-37

Ozorhon, B., & Karahan, U. (2017). Critical success factors of building information modeling implementation. *Journal of management in engineering*, *33*(3), 04016054.

Rungi, M. (2010). Success rate and resource consumption from project interdependencies. *Industrial Management & Data Systems*, *110*(1), 93-100.

Selig, G. J. (2016). IT governance-an integrated framework and roadmap: How to plan, deploy and sustain for improved effectiveness. *Journal of International Technology and Information Management*, *25*(1), 4.

Shaukat, M. B., Latif, K. F., Sajjad, A., & Eweje, G. (2022). Revisiting the relationship between sustainable project management and project success: The moderating role of stakeholder engagement and team building. *Sustainable Development*, *30*(1), 58-75.

Silva, G. A., Warnakulasooriya, B. N. F., & Arachchige, B. (2016). Criteria for construction project success: A literature review. In *University of Sri Jayewardenepura, Sri Lanka, 13th International Conference on Business Management (ICBM)*.

Uwamahoro Kayumba, C. (2019). Effect of outsourcing on organizational performance in Rwanda. *Dissertation*. Umeå School of Business and Economics.

Vedal, H., Stray, V., Berntzen, M., Moe, N.B. (2021). Managing Dependencies in Large-Scale Agile. In: Gregory, P., Kruchten, P. (eds) Agile Processes in Software Engineering and Extreme Programming – Workshops. XP 2021. Lecture Notes in Business Information Processing, 426..

Wachira, F. N., Gakure, R. W., & Orwa, G. (2012). The Effect of 'Human Resource Development Professionals expertise'on effectiveness of Management Development in the civil service of Kenya. *International Journal of Business and Social Research (IJBSR)*, *2*(6), 217-225.

Yang, X., Yu, M., & Zhu, F. (2020). Impact of Project Planning on Knowledge Integration in Construction Projects. *Journal of Construction Engineering and Management*, 146 (7), 04020066

Yap, J. B. H., Leong, W. J., & Skitmore, M. (2020). Capitalising teamwork for enhancing project delivery and management in construction: empirical study in Malaysia. *Engineering, Construction and Architectural Management*, *27*(7), 1479-1503.

Yawar, S. A., & Seuring, S. (2017). Management of social issues in supply chains: a literature review exploring social issues, actions and performance outcomes. *Journal of Business Ethics*, *141*(3), 621-643.

Yusoff, Y. M., Nejati, M., Kee, D. M. H., & Amran, A. (2020). Linking Green Human Resource Management Practices to Environmental Performance in Hotel Industry. Global Business Review, 21(3), 663–680.