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RESOURCE MANAGEMENT TECHNIQUES AND SUSTAINABILITY OF DONOR FUNDED INTERNET CONNECTIVITY PROJECTS IN PUBLIC SCHOOLS IN BUNGOMA COUNTY, KENYA

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ABSTRACT

Poor performance of projects in both the public and private organizations is not by chance, but the failures are because of classic project management errors and failure. One of these failures is resource management which have been embraced by both public and private organizations. Resource plays a crucial purpose in any project. The specific objective of the study were to examine the effect of project resource management techniques on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya. The specific objectives were to examine effect of resource allocation and resource forecasting on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya. The study will be guided by four theories: resource-based view theory, resource dependency financial literacy theory, and theory of project constraints. The study will adopt a descriptive research design. The study targeted 54 public schools in Bungoma County, Kenya connected under the Education Broadband Connectivity Project. The schools have a total of the schools have a total of 54 ICT teachers and 54 principals who were the study unit of observation. The study used census hence 108 respondents were sampled. Questionnaires were used to collect data. The pilot test was conducted with 10% of the sample hence five ICT teachers and five principals. board members. This study will use content and construct validity. Cronbach's Alpha Coefficient was used to measure questionnaires' reliability. Quantitative data was coded and analyzed using Statistical Package for Social Sciences (SPSS) Version 28. Data was analyzed presented in tables. Project resource allocation affect project performance. Resource allocation aids in assigning resources to tasks throughout the life of a project. The project managers make efforts to thoroughly plan project resources. The project managers lack skills in the resource estimation in the communication industry which may hinder them from effectively estimating the resources required to implement such projects. Funds allocation should be based on based on actual budgetary requirements, the funds approval process must be clear and easily understood and there should be no bureaucracies involved in funds allocation. This will create balance of resources within the project

Key Words; Resource Management Techniques, Resource Allocation And Resource Forecasting

Background of the Study

Project Resource Management is the art of planning, allocating, managing, and measuring the work that people do to complete a project. Project "resources" could be the people, equipment, facilities, or anything else needed to get work done. It is relatively simple to define, however, it's the people part of the resource equation that makes this one of the most complex operations for businesses to manage. Nelson and Jansen (2017) noted that poor performance of projects in both the public and private organizations is not by chance, but the failures are because of classic project management errors and failure. One of these failures is resource management which have been embraced by both public and private organizations. Resource plays a crucial purpose in any project.

Management of resources within a project is inclusive of the procurement and deployment of external and internal resources that are prerequisite for project delivery. Its major focus is prioritization when it comes to utilization of resources, monitoring production and usage of resources and measurement of the effectiveness of resources (Engwall, 2018). Management of resources is an aspect of project planning which converges on supplies utilized in the production of deliverables of a project. Management of resources of a project is often inclusive, but not limited to, costs of materials, labor, and equipment within the work of the project (Kerzner & Kerzner, 2017). Chan, Chua, and Kannan (2018) observe that resource scheduling makes for better time estimates, as it provides one more metric by which to measure your project schedule. With resource scheduling comes superior organization for projects, teams, sites, equipment, and any other resource associated with the project. All this sets the stage for an intelligent distribution of resources among your project tasks.

The broadband connectivity project for schools was funded through the Universal Service Fund (USF) under the guidance of the Communications Authority of Kenya. It was deemed a key enabler and essential for closing the digital access gap. Schools were identified as important community institutions in which broadband connectivity should be expanded, alongside health facilities, government offices, post offices, libraries, and other community facilities. The project covered all 47 counties, but regional coverage was uneven. Affirmative action was applied in some counties when selecting schools, especially in Mandera, Turkana, Wajir, Garissa, Kwale, Isiolo, Samburu and Tana River counties, to ensure that every county had a beneficiary school in the project (Communications Authority, 2022). Service providers were contracted to supply, install, test, commission and maintain connectivity in 886 public secondary schools across the country. The education sector has been targeted for improvement in recent years. CA through support of the Fund has undertaken a pilot project involving connectivity of selected secondary schools in its broadband education program since 2016. UNICEF is targeting to connect 1,160 primary schools under a pilot focus project under its Giga initiative program. The program envisages having internet connectivity for all schools in the developing world. However, Access to education in some parts of the country is still undermined by inappropriate teaching materials, poor infrastructure, inadequate allocation of high-quality teachers and difficulties in retaining them. Such disparities call for the Ministry of Education and CA as implementers and facilitators respectively to pursue partnership collaborations and build synergy to ensure the education sector delivers service to the subject communities.

Sánchez (2015) defines project sustainability as the ability to support the provision of its objectives both at communal and institutional levels without adverse implications even after eliminating tools such as capital resources, deliverables, initiation, and execution. Carvalho further insists that it is the likelihood that the project will survive after the performance. Project sustainability is reflected in the capacity of the community to cope with change and adapt to new situations. A project that is seen as worth sustaining today may not be so in future. Sustainability

of a project ensures benefits from a project are felt for extended periods of time that can justify the economic and social input invested into the project (Hayward & Neuberger, 2010).

For a project to achieve sustainability, it needs to be implemented through a strategic approach. The strategic approach incorporates four main elements: future orientation, which assumes that things will change and so planning to maximize benefits may be derived during and from that change. A sustainable project is that one whose short-term outputs are highly valued by the stakeholders such that they are willing to sacrifice and commit resources to the maintenance of the project to ensure it produces outputs in the long term (Kimani & Namusonge, 2016).

Statement of the Problem

Very high-speed broadband networks are seen as a key enabler for socio-economic development. As technology develops, internet service providers are making efforts to ensure educational institutions have dependable, fast internet connectivity to use digital education's advantages fully. The Internet connectivity in schools has been associated with unreliability and inadequate ICT human resources capacity. The Internet provides great opportunities to improve the quality of education. New ways of teaching and learning, better access to a much wider range of information and resources, new skills for the digital age. These can transform lives, helping to achieve education for all and other Sustainable Development Goals (Makato, Ondiek, & Omulo, 2022). Digitizing documents helps to eliminate paper products, conserve storage space, and protect important and confidential documents. Once files are digitally stored, they can be easily shared and accessed by authorized personnel in an office, eliminating the need to make additional physical copies (Afzal, Firdousi, Waqar, & Awais, 2022).

Although the government has made efforts to enhance internet connectivity in public schools, the projects sustainability is questionable. This is an issue affecting majority of schools whereby the internet infrastructure is no longer in use as the school administration is not able to meet the maintenance costs. A study conducted Kenya ICT Board in 2022 showed that 8% of the schools that benefited from the broadband connectivity project experienced frequent internet buffering. In addition, there was poor internet connection in 43% of the schools and the projects worked perfectly in 51% of the schools. The school administration was not able to meet the internet costs and the teachers paid for Internet bundles out of pocket and connected to ISPs with functioning broadband connectivity in their regions. The teachers, principals and technicians complained of unstable connection in the school administration block, library, and computer lab. The schools spent on average KES 15 000 (USD 142) on broadband access and KES 500 000 (USD 4 760) on other ICT-related expenses. International Telecommunication Union Development (2023) found that majority of secondary schools in Bungoma county have been paying Sh15, 000 for internet which at some point fails to serve the school as required.

Katitia, Tanui, and Oruta (2019) found that 59% of secondary schools that are connected to the internet in Kenya are challenged with power shortage. Principals are forced to buy and fuel generators which are expensive to sustain fuel every time there's powers shortage. Kukali, Kawasonga, and Rabari (2018) found that Bungoma County have a negligible number of schools with reliable internet connectivity where 71.4% of the schools had poor internet connection and interrupted power supplies. Unreliable internet and power supply demoralises principals' effort to file statistics returns to the employer. Only a few schools have an active website where school information on KCSE results and school successes is safely stored for future reference and retrieval. The website was rarely visited in day-to-day activities as most were unmaintained and therefore inactive. In addition, that 57.1% of the schools do not have trained ICT experts who fixes ICT gadgets.

There exist various studies on project resource management techniques; Abdi (2020) found that resource management techniques significantly affect project performance, Makokha and Ngugi

(2023) found that resource allocation had a positive and significant influence on projects performance by Busia County government, Kenya, Kogi (2018) noted that funding levels, project cost management, and project planning determines project outcome. There is study limitation on project resource management techniques in education sector in Kenya. The study aims at filling the research gap by examining the effect of resource management techniques on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya.

General Objective

To determine the effect of resource management techniques on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya

Specific Objectives of the study

i. To examine the effect of resource allocation on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya.
ii. To assess the effect of resource forecasting on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya.

Theoretical Review

Resource Based View Theory

The resource-based view theory was developed by Barney (1991). The theory indicates that the possession of resources which are strategic provides a given organization with a superb chance of creating a competitive advantage over their rivals. This competitive edge can aid the organization in enjoyment of unassailable profits as when compared to similar competing groups. Managers of projects have a role of utilizing resources which are made available throughout the cycle stages of a project in ensuring their success as compared to implementation of projects of other institutions as follows; identification and classification of the resources within the firm, estimation of capabilities and vulnerabilities in relation to their rivals, identification of opportunities in ensuring that resources are utilized in a better way, identification of capabilities of the firm, assessing the ability of resources to generate returns and how capable they are in terms of maintaining sustainability, selection of a the best resource exploitation strategy within the firm in relation to its rivals and identification of gaps in the resources that need to be bridged (Johnstone & Brenman,1996). This theory is an exploration of the desire for the right form of planning and implementation of projects based on availability of resources. Based on this, management makes use of the readily obtainable resources and utilizing them for maximum success of projects in place. This theory is thus fundamental as it stresses on the correct form of allocation of project resources towards ensuring that projects are sustainable.

Financial Literacy Theory

Financial Literacy Theory was developed by Lusardi and Mitchell (2008). The theory argues that the behavior of people with a high level of financial literacy might depend on the prevalence of the two thinking styles according to dual-process theories: intuition and cognition. Financial literacy remains an interesting issue in both developed and developing economies and has elicited much interest in the recent past with the rapid change in the financial landscape. Financial knowledge is a form of investment in human capital like the necessary financial management skills. Gallery, Newton, and Palm (2011) show that financial literacy, knowledge on financial management practices, shapes economic outcomes derived from performing firms.

Financial literacy theory argues that the behavior of people with a high level of financial management practices might depend on the prevalence of the two thinking styles: intuition and cognition. Financial literacy, which embeds the financial management practices helps in

empowering and educating investors and owners of businesses so that they are knowledgeable about financial management practices in a way that is relevant to their business and enables them to use this knowledge to evaluate products and make informed decisions that will lead to performing firm's (Lusardi & Oliver,2006). This theory supports the objective on resource forecasting since it is related to how individuals manage their ability to understand financial products and services, to be well-literate to a variety of financial products and services that are always dynamic and fluctuative.

Conceptual Framework

A conceptual framework is a diagrammatic representation of the relationship between the study variables. It helps to explain the relationship between the independent variables and the dependent variables. Figure 2.1 presents the conceptual framework.

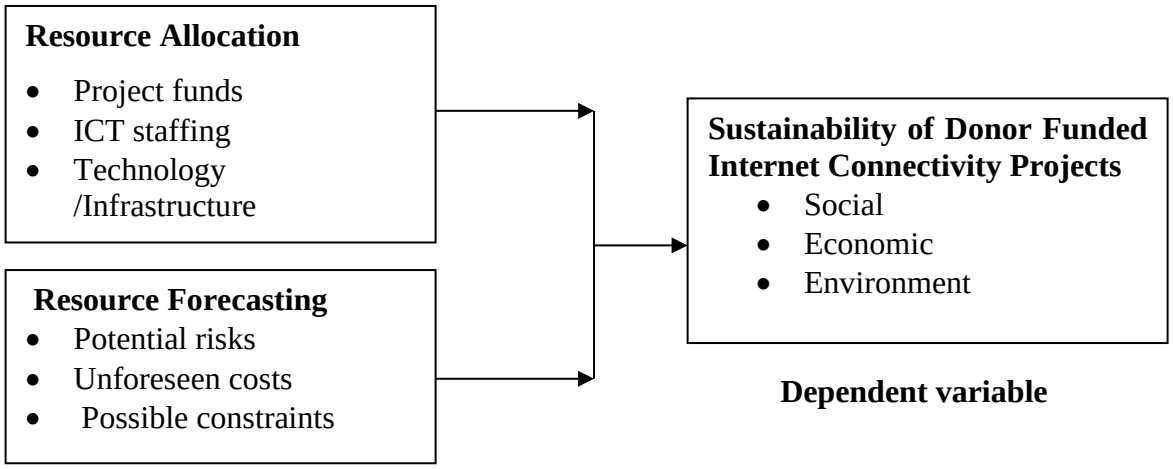

Figure 1: Conceptual Framework

Resource Allocation

According to Chilton (2020), resource allocation is the process of assigning resources to tasks throughout the life of a project. Despite sophisticated software packages devoted to keeping track of tasks, resources, and resource assignments, it is often the case that project managers find some resources over-allocated and therefore unable to complete the assigned work in the allotted amount of time. Most scheduling software has provisions for leveling resources, but the techniques for doing so simply add time to the schedule and may cause delays in tasks that are critical to the project in meeting deadlines. Engwall and Jerbrant (2018) added that resource allocation in project management is important because it gives a clear picture on the amount of work that must be done and allows to plan and prepare for the project's implementation or achieving goals which makes it possible to analyze existing threats and risks to the project resulting to better project performance. Inadequate allocation of finances would adversely affect the quality of projects (Omesa, Gachunga, Okibo & Ogutu, 2019).

Allocation of adequate resources to the project team facilitates timely collection and analysis of data to generate status and progress reports of the program on time. Resource allocation should be altered on a frequent basis in a dynamic business climate, especially when important events occur, such as a dramatic drop in oil prices. For investments, some companies use a methodical stage-gating process. When developing new products and services, it's common to defer some of the expenditure until there's proof that it's working. External (demand growth, rival launches, and regulation) and internal (new technology, changes in talent) material risks must be recognized in

the strategic planning process, and clear threshold levels must be established at which resource deployment decisions must be reassessed (Nouri, Riahi, Haji Nabi & Jahangiri, 2020).

Resource Forecasting

Resource forecasting is the process of estimating future resource requirements based on historical data, current trends, and future demand. Resource forecasting is crucial for predicting future staffing needs, managing budgets, and ensuring that resources are utilized efficiently. Resource forecasting allows a project manager to predict future resource requirements before a project begins. During the planning stages of a project, a manager should consider resource management software that forecasts the project's scope, possible constraints, unforeseen costs, and potential risks (Liu & Hao, 2021). Resource forecasting is an essential function of the resource management process. Before projects kick off, it ensures that they are suitably staffed and equipped to respond to unforeseen circumstances during the entire lifecycle. It also estimates the workload, skill requirements, project financials and helps organizations achieve profitable resource utilization. Enterprises fail to deliver projects on time and within budget without the right forecasting tools. It also results in low client satisfaction and jeopardizes the firm's reputation. This is how resource forecasting is essential for project managers.

Resource forecasting helps organizations optimize resource utilization. By accurately predicting future resource needs, organizations can avoid underutilization or overutilization of resources, which can lead to wasted time, money, and effort. Resource forecasting is important for managing budgets. Accurate forecasting can help organizations allocate resources more effectively, ensuring that they are able to stay within budget constraints. Accurate resource forecasting empowers organizations to distribute resources efficiently among different projects and endeavors. This helps prevent both resource overload and underutilization, ultimately resulting in heightened productivity and cost efficiency. When organizations have a clear understanding of their future resource requirements, they can make informed decisions about hiring, training, and outsourcing. This results in better resource utilization and project execution (Zarghami, 2022). Additionally, manpower forecasting plays an important role in labor resource planning, which is essential for the business planning process. Sustaining staff levels in a firm is a challenge due to the temporary nature of projects. Also, labor requirements fluctuate during project execution due to the distinctive nature of each phase in a project. Accordingly, forecasting accurate staff requirements is difficult because of substantial variations in output. Thus, the selection of a proper forecasting technique is critical to achieve reliable results with good accuracy (Fini et al., 2018). Therefore, a good forecasting procedure is a facilitator to ensure that the established delivery schedule is executed without delays. Forecasting also helps to anticipate potential problems so the management can navigate these obstacles easily if the happen (Chika, 2020). Resource forecasting helps project managers and team leaders to determine whether project activities can be completed based on the number of resources available and the time frame in which they will be needed.

Empirical Review

Resource Allocation and Project Performance

Sweden, Jonsson (2016) investigated the impact of resource planning in a multi-project organization. The study selected all project leaders. Data was collected using interviews and questionnaires. According to the findings, resource planning is still an issue in multi-project organizations. The project staff were found to have significant levels of project overload, resulting in psychological stress reactions both outside and inside the workplace. In a multi-project organization, the researcher suggested using a resource planning tool to lower the amount of perceived psychological stress reactions.

Nair and Shashi (2016) conducted a study of several projects developed in a product and service-based Software Company. Results showed a significant impact of effective resource allocation on success of software projects. The analysis further indicates the vital role of project managers in optimizing the resource allocation towards development of software. Role of project manager aims towards estimation and apt allocation of resources in successfully developing projects. However, there was existence of variations between resource estimation prior to the development process and actual allocation of resources during the developmental period by the project manager.

Gashuga, Kule, and Ndabaga (2016) evaluated how the management of funds affected project performance in Rwanda focusing on a case of Dairy Community Processing Center Project Burera District. This study used a descriptive-correlation research design. Findings indicated that funds allocation improved project delivery and hence project performance. The study noted that the allocation of funds minimized administrative costs, it resulted to enhanced prediction of project efficiency and reduced the minimized the general project risk. Mogaka (2017) analyzed the relationship between the procedures in disbursing funds and how health projects that were funded by donors in Nairobi County were being implemented. A descriptive survey design was adopted. Findings showed that allocating resources positively and significantly impacted the execution of these projects. Resource allocation aided in assigning resources to tasks throughout the life of the project. The study underscored the urgency of sufficient allocation of project resources in implementing the projects. The study laid emphasis on adequate training of project personnel, disbursement of project resources on time.

Njiru (2018) evaluated the relationship between project management practices and implementing projects within the firms of manufacture within the county of Nairobi. The study used a descriptive design of research. Results showed a positively significant relationship between allocation of resources and project implementation. Allocating resources assisted project managers to marshal project reams with great productivity and efficiency in undertaking tasks which enabled them to assess project schedules and certainly appraise resource availability with immediate effect. Anunda (2016) assessed the issues that affected the success of projects of funded by NGOs within Nairobi County. A descriptive research design was used. Results showed that allocating adequate funds and drawing many donors and partners impacted on the success of these endeavors. Majority of NGOs implementing the projects under study lacked adequate financing. Dedicating sufficient allocations of monetary and non-monetary resources was a fundamental factor in successfully implementing project plans. It was learnt that many projects ran out of resources before they were completed.

Resource Forecasting and Project Performance

Kotb, Ibrahim, and Al-Olayan (2018) studied impact of cash flow forecasting on performance of construction projects in Kuwait. Questionnaires were used to collect data from a sample of 100 citizens. Results showed that there was underestimation of project resources. The available estimates were less than the required cash flow which was considered as a major cause for delay in project completion as well as the inability of the owner to achieve the economic feasibility. Also, this leads to monitory error due to the financial compensations due to the contractor because of the damage caused by time extensions due to the holdings of the cash entitlements. In the case of overestimation of the value of the required cash flow with a high margin of error, this leads to the monetary waste of amounts that could have been invested in other ventures, projects, or opportunities.

Mäkiaho (2019) examined the diverse influences of accurate and inaccurate revenue forecasting on the performance of financial management and related business functions. The research

examined the construction stream of Skanska Finland. Data was collected through combining the quantitative financial data and the qualitative material from ten interviews. The findings of this study stated that future-oriented market review, better system support, automation, sharing of the best practices, more profound focus on the forecasting of target works, communication, training and process follow-up have most potential to improve the accuracy of financial forecasting. Elkholosy (2020) aimed at providing a methodology that will help in forecasting the project management staff hours for a given project. The projects were tracked through status reports in unstructured text documents and spreadsheets. Each manager responsible for multiple projects developed their own tracking sheets. The reports included the project budget, consultants, contractors, actual start dates and finish dates of the project, and the project phase. Results showed that few projects might have over allocated hours since they were under budget during execution and vice versa. Tracking the hours for some projects was not possible due to the unavailability of a proper tracking system.

Omopariola and Abimbola. (2019) examined the financial management strategies used by construction organizations and whether these approaches result in competitive advantages, and improved project and organizational performance. The study used questionnaires to collect data. Results showed that cash flow, leverage and liquidity are effective performance evaluation systems for the construction project and organizations in South Africa. The study found that delay in payments, difficulty in obtaining financial aid and inadequate budgetary control are the causes of cash flow problems during construction projects. These issues result in project delays, reduced profit margins and in the worst scenarios, abandoned projects. The financial management strategies used have a positive effect on project and organization performance. The study concluded that construction organizations will perform better when a combination of financial management strategies are used in their operations.

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive research design. The choice of this design is in line with Orodho (2009) that descriptive survey defines the connection that exists between specific events in a research study. This design allows researchers to gather information, summarize, present, and interpret for the purpose of clarification. Descriptive study gives statistical data on areas of discipline that policymakers and educators are interested in (Crossman, 2013). Descriptive research is carefully planned to offer a detailed description of the circumstance and to ensure that data gathering is free of bias. Descriptive research design was preferred since it provides valuable responses to questions that seek to give a comprehensive description of a situation (Cooper & Schindler, 2013).

Target Population

The study targeted public schools in Bungoma County, Kenya connected under the Education Broadband Connectivity Project. According to the Communications Authority of Kenya, there are 54 public schools in Bungoma County that are under the Education Broadband Connectivity Project. The schools will be the study unit of analysis. The schools have a total of 54 ICT teachers and 54 principals which were the study unit of observation.

Sampling Frame

A sampling frame is a list of the actual cases from which the sample was drawn and must represent the population (Ruel, 2020). The sampling frame of this study was 54 public schools in Bungoma County that are under the Education Broadband Connectivity Project.

Sample Size and Sampling Technique

The study adopted census sampling. Census aims at gathering information about every member of the population. Census is most suitable population is less than 200. Through census, deep study of the subject is possible so that the researcher can get the total information of the variable of interest. Census also enhances high level of accuracy because the study is conducted in one area therefore the results are accurate at higher degree (Yin, 2013). The study sample was hence 108 respondents.

Data Collection Instruments

The main tool for data collection in this study was the questionnaire. The questionnaires were used for data collection because they offer considerable advantages in the administration, and the opinions of respondents can be obtained in a structured manner. It also presents an even stimulus potential to large numbers of people simultaneously and provides the investigation with an easy accumulation of data (Orodho, 2010). Questionnaires have a guarantee of anonymity, and standardized questions that help in producing candid answers, thus, allowing the researcher to collect a broad spectrum of views and seek opinions. The questionnaire had a Likert scale ranging from 1-strongly disagree to agree 5-strongly. The questionnaire had six sections (A-F). Section A on the demographic information, section B on resource allocation, section C on resource utilization, section D on resource forecasting, section E on resource leveling, and section F on project performance.

Pilot Study

The pilot test was conducted with 10% of the sample hence five ICT teachers and five principals as recommended by (Neff &Germer, 2013). A pilot study offers the researcher the chance to measure 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.

Data Analysis and Presentation

The raw data collected from the field was organized to facilitate analysis. Quantitative data was coded and analyzed using Statistical Package for Social Sciences (SPSS) Version 28. Data was analyzed using both descriptive statistics (frequency, percentage, mean) and inferential statistics (Pearson correlation and regression). Findings were tabulated and interpreted accordingly. The multiple regression equation was.

RESEARCH FINDINGS AND DISCUSSIONS

Resource Allocation

The first objective sought to examine the effect of resource allocation on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya. Respondents were asked to indicate the extent to which they agreed on statements related resource allocation. Findings are presented in Table 4.1.

Table 4. 1: Resource Allocation

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 established resource allocation plans that guide resource allocations**.**	0	0	17	22.4	5	6.6	12	15.8	42	55.3	4.04
There is always adequate and efficient allocation of resources needed in sustaining digital projects**.**	41	53.9	13	17.1	6	7.9	9	11.8	7	9.2	2.05
There is timely allocation of resources needed in sustaining projects**.**	29	38.2	30	39.5	7	9.2	2	2.6	8	10.5	1.92
There are different sources of funds to sustain projects**.**	0	0	7	9.2	9	11.8	28	36.8	32	42.1	3.97
There are computer networks to coordinate finances allocated to the ICT projects**.**	8	10.5	5	6.6	3	3.9	33	43.4	27	35.5	3.87
Material resource planning (MRP) is carried out to estimate the quantities of inventories needed to implement projects**.**	0	0	6	7.9	10	13.2	17	22.4	43	56.6	4.32
There is thorough planning of all the resources used in carrying out digital projects in the school**.**	5	6.6	5	6.6	5	6.6	12	15.8	49	64.5	4.25
The resource plans are adhered to throughout the project cycles**.**	37	48.7	30	39.5	2	2.6	2	2.6	5	6.6	2.21

N=76

Findings show that majority of the staff strongly agreed that; material resource planning (MRP) is carried out to estimate the quantities of inventories needed to implement projects(M=4.32), and there is thorough planning of all the resources used in carrying out digital projects in the school(M=4.25). The respondents agreed that; there are established resource allocation plans that guide resource allocations (M=4.04), there are different sources of funds to sustain projects(M=3.97), and there are computer networks to coordinate finances allocated to the ICT projects(M=3.87). Respondents disagreed that; the resource plans are adhered to throughout the project cycles (M=2.21), there is always adequate and efficient allocation of resources needed in sustaining digital projects(M=2.05), and there is timely allocation of resources needed in sustaining projects(M=1.92).

Findings imply that the resources allocated for digitalized projects are not enough. The projects managers however make efforts to effectively manage the available resources. They utilize material resource planning to estimate the materials needed for the projects and they also plan for the resources available. The resources are however inadequate, and they are not availed on time. This hinders the project managers from allocation adequate resources for every project activity resulting to lack of adherence to resource plans. Some resources are hence directed to project activities that were not initially planned for. Findings agree with Gashuga, Kule, and Ndabaga (2016) who also found out that adequate funds' allocation ensures project success. Njiru (2018) also found that allocating resources assist project managers to assess project schedules and implement projects within set budget and timelines.

Resource Forecasting

The third objective aimed at assessing the effect of resource forecasting on sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya. The respondents were asked to indicate the extent to which they agreed on statements related to resource forecasting. Findings are presented in Table 4.2.

Table 4. 2: Resource Forecasting

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 board can determine the actual cash needed to sustain the projects**.**	6	7.9	10	13.2	2	2.6	10	13.2	48	63.2	4.11
The board has the possibility to know if materials will be sustainable**.**	8	10.5	5	6.6	4	5.3	14	18.4	45	59.2	4.09
The board has ability to assess the financial and actual situation of the project**.**	11	14.5	8	10.5	2	2.6	15	19.7	40	52.6	3.86
There is effective utilization of a financial management tool to control all the finance issues in projects**.**	9	11.8	6	7.9	2	2.6	31	40.8	28	36.8	3.83
The projects are tracked through status reports in unstructured text documents and spreadsheets**.**	7	9.2	9	11.8	3	3.9	14	18.4	43	56.6	4.01
The board members understand industry practices in resource allocation and estimation, collecting and analyzing historical data**.**	54	71.1	10	13.2	2	2.6	6	7.9	4	5.3	1.87
The projects are over allocated hours since they were under budget during execution and vice versa	10	13.2	2	2.6	5	6.6	17	22.4	42	55.3	4.04

N=76

Findings show that the respondents agreed that; the board can determine the actual cash needed to sustain the projects (M=4.11), the board has the possibility to know if materials will be sustainable (M=4.09), the projects are over allocated hours since they were under budget during execution and vice versa (M=4.04), the projects are tracked through status reports in unstructured text documents and spreadsheets (M=4.01), the board has ability to assess the financial and actual situation of the project (M=3.86), and there is effective utilization of a financial management tool to control all the finance issues in projects(M=3.83). Respondents disagreed that the board members understand industry practices in resource allocation and estimation, collecting and analyzing historical data (M=1.87).

Findings imply that the project managers lack the skills needed to accurately predict the resources required in implementation of digitalized projects. They however make efforts to make a rough estimate of the actual cash required to sustain the digitalized projects. They also have ability to know whether the material available would enhance project sustainability. There is also evidence of under budgeting and time overruns which is a prove of inaccurate forecasting of project costs. Findings concur with Kotb, Ibrahim, and Al-Olayan (2018) poor estimation of project costs is a major cause for delay. Elkholosy (2020) also added that inaccurate forecast of project resources leads to allocation of more project timeline and less budget.

Pearson Correlation Analysis

Correlation indicates the strength and significance of the relationship between the study variables. Correlation findings are presented in Table 4.3.

Table 4. 3: Correlation Coefficients

Variables		Project sustainability	Resource allocation	Resource forecasting
Project sustainability	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	76		
Resource allocation	Pearson Correlation	.870	1	
	Sig. (2-tailed)	.000**		
	N	76		
Resource forecasting	Pearson Correlation	831	.283	1
	Sig. (2-tailed)	.000**	.013	
	N	76	76	

Findings show that; there is strong significant relationship between resource allocation and project sustainability (r=0.870, r=0.000). This is an indication that resource allocation significantly affects project sustainability to a very great extent. Findings are in support of Mogaka (2017) that allocating resources positively and significantly impacted the execution of these projects.

Results show a strong significant relationship between resource forecasting and project sustainability (r=0.831, r=0.000). Findings indicate that resource forecasting significantly affect project sustainability to a very great extent. Findings support Omopariola and Abimbola. (2019) that the financial estimation strategies have a positive effect on project performance.

Regression Analysis

A regression analysis helps to establish establishing how a change in the independent variable would predict changes in the independent variable. The three outputs of a regression analysis include Model summary, ANOVA, and regression coefficients .

Table 4. 4: Model Summary

Model	R	R^2	Adjusted r^2	Std. Error of the Estimate
1	0.890	0.793	0.781	696

Predicators: (constant) *resource allocation, resource utilization, resource forecasting, and resource leveling*

Table 4.5 show R^2 value of 0.793 which implies that 79.3% of the project resource management techniques studied contribute 79.3% to sustainability of donor funded internet connectivity projects. Therefore, other project resource management techniques that were not included in the study contribute to 20.7% of project sustainability.

Table 4. 5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	131.555	2	65.77	139.64	.000[b]
	Residual	34.392	73	.471		
	Total	165.947	75			

Predicators: (constant) resource allocation, resource forecasting,
Dependent variable: Project Sustainability

Results show that regression model had an F value of 139.64 (p= 0.000). The F value is greater than 1 showing that the regression model is effective in its explanation of the variation in the dependent. Mangera (2020) indicated that an F value greater than 1 is recommended since it shows the suitability of the model in explaining the changes in dependent variable as caused by the independent variable. The probability value of 0.000 indicates that the regression relationship is highly significant in predicting how project resource management techniques would cause changes in sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya.

Table 4. 6: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant/Y Intercept	4.930	.383		12.857	.000
Resource allocation	1.721	.298	1.635	5.779	.000
Resource forecasting	.755	.293	.706	3.070	.003

Based on the results in Table 4.6, the equation

$$\boldsymbol{y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + +\varepsilon}$$

Project sustainability= 4.930 + 1.721 (resource allocation) + 0.755 (resource forecasting)

Findings show that holding all other factors at constant zero, sustainability of donor funded internet connectivity projects in public schools in Bungoma County, Kenya would be 4.930. The equation also shows that a unit increase in resource allocation results in a 1.721 change in project sustainability, a unit increase in resource forecasting results in a 0.755 change in performance of manufacturing firms,

Conclusion

Project resource allocation affect project performance. Resource allocation aids in assigning resources to tasks throughout the life of a project. The project managers make efforts to thoroughly plan project resources. The project managers diversify sources of project funds and information technology is used to coordinate project finances. Inadequate resource allocation led to budget overruns and project delays. The projects funds are delayed, and they are also not adequate. This is an indication that there is shortage of materials and manpower to implement the project which affects project sustainability.

The project managers lack skills in the resource estimation in the communication industry which may hinder them from effectively estimating the resources required to implement such projects. The actual cost required to sustain the digitized projects are determined the school boards. The board also determines whether the project materials would be sustainable. Due to resource constraints the projects consume more time that initially planned. The project managers constantly monitor the projects to keep close watch of the project progress. Estimating the

project schedule accurately is essential for the project's and the project manager's success. If the forecast is not correctly done, the project may be incomplete when workers fail to meet deadlines. Forecasting also helps the project manager to plan for unknown factors that can throw the project off course.

Recommendations

Funds allocation should be based on based on actual budgetary requirements, the funds approval process must be clear and easily understood and there should be no bureaucracies involved in funds allocation. This will create balance of resources within the project. The project managers should ensure that all resource plans are adhered to throughout project cycles. This will ensure that only materials and services that are budgeted for will be financed hence avoiding project costs overruns. Project managers should also ensure that all project activities are allocated adequate resources and should also be timely to avoid project delays.

The project managers should adopt proper project forecasting systems to ensure accurate estimation of project timeliness and budget. The project managers should also review reports from similar completed projects to help in estimating the project resources required to effectively complete the projects which will ensure quality projects are delivered within budget and set time and will also enhance project sustainability. The managers should also benchmark on other digitalized projects to be able to forecast the resources used in such projects and other project management aspects that may enhance project sustainability.

REFERENCES

Afzal, A., Firdousi, S. F., Waqar, A.& Awais, M. (2022). The Influence of Internet Penetration on Poverty and Income Inequality. *SAGE Open, 12*(3)

Alhady, A. & Ashraf, S. (2022). Analyzing Resource Allocation and Levelling in construction Projects. *American Journal of Engineering Research*, 11(4) 108-117

Amade, B., Ogbonna, A., & Kaduru, C. (2018). Determinants of successful project implementation in Nigeria. *International Journal of Management Sciences and Business Research*, 1(6), 56 – 69

Anunda, S. (2016). *Factors influencing the performance of projects implemented by NGOs in the health sector: A case of HIV/AIDS projects in Nairobi County, Kenya.* Unpublished Thesis: University of Nairobi.

Balaji, V. & Venugopal, P. (2017). Resource Utilization In Construction Projects And Its Impacts Of High Ranked Variable During Time Over Run: A Review. *International Journal of Current Engineering and Scientific Research*, 4(7)31-35

Chaudhari, M. (2019). Optimum Resources Utilization In Construction Industry. *Journal of Emerging Technologies and Innovative Research* , 6(6)704-710

Ehiorobo, O. (2018). Efficient Resource Allocation And Utilization: *The Missing Link In Nigeria's Quest For Sustainable Development. Economics and Business*, 32(1) 264–275

Ehiorobo, O. A. (2018). Privatization of Public Enterprises in Nigeria: Recipe for Sleaze of National Development? *Academic Journal of Economic Studies*, 4(1), 68–73

Eirgash, M. A., Toğan, V., & Dede, T. (2019). "A multi-objective decision-making model based on TLBO for the time–cost trade-off problems." *Struct. Eng. Mech.*, 71 (2), 139-151

Engwall, M., & Jerbrant, A. (2018). The resource allocation syndrome: the prime challenge of multi-project management? *International journal of project management*, 21(6), 403-409

Gashuga, D., Kule, J. W., &Ndabaga, E. (2016). Effect of funds management on project performance in Rwanda; Case study of Dairy Community Processing Center ProjectBurera District. *International Journal of Scientific and Research Publications*, 6(10), 628-649

Jogi, J. & Asadi, S. (2017). Optimal Resources Utilization In construction Industry. *International Journal of Civil Engineering and Technology* 8(1)273-280

Katitia M, Tanui, E. & Oruta. (2019). The Role of School Administration in Implementation of ICT in Human Resources Administration in Public Secondary Schools. *Journal of Advances in Education and Philosophy*, 3(10) 364-371

Koyi W. M., Miroga, J. & Otinga, H. (2021). Influence of resource management practices on timely completion of road projects implemented by the County Government of Kakamega County, Kenya. *The Strategic Journal of Business & Change Management,* 8 (2), 244 – 260

Kukali, N., Kawasonga, M.& Rabari, J. (2018). Impact of Principals' Leadership in ICT Integration in Public Secondary Schools Management in Bungoma County, Kenya. *Journal of Information Engineering and Applications*, 8(5)1-11

Liu, S., & Hao, W. (2021). Forecasting the scheduling issues in engineering project management: Applications of deep learning models. *Future Generation Computer Systems*, *123*, 85-93.

Makato, K., Ondiek, O. & Omulo, O. (2022). Successful Implementation of ICT Policy in Secondary Schools In Mbooni East Sub County In Makueni County, Kenya. *International Journal of Social Science and Humanities Research* , 10(3) 381-390

Mäkiaho, M. (2019). *Accuracy Of Revenue Forecasting As a Developer Of Financial Management In The Construction Industry – Case Skanska*. Unpublished Thesis: LUT University

Makokha, T. & Ngugi, L. (2022). Influence of Resource Allocation on Project Implementation By Busia County Government, Kenya. *International Journal of Management and Commerce Innovations*, 10(2) 55-60

Meredith, J. R., Shafer, S. M., & Mantel Jr, S. J. (2017). Project management: a strategic managerial approach. John Wiley & Sons

Mutisya, A. M., & Mwania, J. M. (2020). The Extent of ICT integration in the Management of Public Secondary Schools in Kitui County, Kenya. *International Journal of Education and Research,*5 (1) 193-204

Njiru, S. G. (2018). Project management practices and implementation of projects in manufacturing companies in Nairobi City County, Kenya.*Unpublished MBA Project, Kenyatta University*

Omesa, J. E. O., Gachunga, H. G., Okibo, B. W., & Ogutu, M. O. (2019). Influence of Financial Resource Allocation on Implementation of Strategic Plans Within The County Governments of Kenya. *African Journal of Emerging Issues*, 1(2), 44-61

Ribeiro, J. & Ramos, J. (2023). Forecasting System and Project Monitoring in Industry. *International Symposium on Distributed Computing and Artificial Intelligence*, 249–25

Runsewe, O. (2017). Nigeria to Become the Extreme Poverty Capital of the World by 2018. Retrieved from http://venturesafrica.com/nigeria-set-to-become-the-extreme-poverty-capital-by-2018/

Sepulveda, H. R. Godue, C., Padilla, M., & Vidaurre, T. D. A. (2019). Assessment of human resources for health programme implementation in 15 Latin American and Caribbean countries. *Human resources for health*, 13(1), 1-9

Zarghami, S. A. (2022). Forecasting project duration in the face of disruptive events: A resource-based approach. *Journal of Construction Engineering and Management*, *148*(5), 04022016.