Project Management Information System and Performance of Community-Based Organizations Projects in Nyeri County, Kenya

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Abstract— **Organizations have transformed gradually from being a single project venture to management of numerous projects. Project managers or management of those organizations are obliged to integrate numerous projects that are complex and manage them simultaneously and ensure there is high level of accuracy and to detail. Project management in contemporary organizations is currently perceived as multifaceted process of implementing initiatives that are assorted whose planning and control needs to be centralized. The main objective of the study was to establish the influence of PMIS on the performance of Community-Based Organizations in Nyeri county. Specifically, the study focused on Quality Information Management and Project Planning, on performance of Community based Organizations projects in Nyeri County. The study was also be guided by Technology Acceptance Theory The study used descriptive survey design where 117 registered CBOs in Nyeri county were studied. A total of 351 respondents comprising of the 3 representatives from the 117 registered CBOs formed the target population. A sample of 186 was drawn from the target population (351) who were administered with questionnaires. The study tried to establish the relationship of the performance of CBOs projects and PMIS integration. The study found that PMIS influenced performance of CBO projects in Nyeri county. To be specific it explains 51.2% of variation in CBO projects performance. The study found Quality Information Management and Project Planning to have significant correlations with CBO projects performance in Nyeri county. The study also found significant positive relationships between Quality Information Management and Project Planning, and CBO projects performance. The study recommended fully integration of PMIS in projects in order to improve performance. The study also recommended a similar study to be done in other counties or other type of projects to affirm the findings and also critique the current findings. The finding of the study will be useful to project managers, NGOs and other project donors.**

Index Terms—**PMIS, Quality Information Output, Project Planning, CBOs Performance**

I. INTRODUCTION

Though they are assumed to be similar to non-governmental organizations (NGOs), community-based organizations (CBOs) are non-profit groups that provide employment at an area level to enhance life for residents by creating equality across society in areas such as health care, environment, quality of education, access to technology, access to spaces, and knowledge for the disabled. CBOs are normally staffed

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by local community members who experience first-hand the requirements within their neighborhood. Besides being connected geographically, the sole link between staff members and their interests is usually the will and willingness to assist. NGOs on the other hand incorporate private organizations that operate without government control which are non-profit and non-criminal. NGOs may be a non-profit, citizen-based group that functions independently of the state [1].

According to the [2] PMIS is an information system (IS) with tools and techniques for collecting, compilation and distribution of project management processes information. It is also known to be a special purpose IS that is useful for the provision of critical information to the project manager and major project stakeholders in a project in order to help in effective decision making [3]. There are variety types of PMIS in the market, their application is dependent on the industry, scope, features as well as design though regardless of the type applied, they all work to improve performance by providing relevant information for effective decision making in management of projects [4]. Built as on communication and documentation of specific project details, PMIS is useful in describing the project and its constraints as well as activities to be performed by the project team. The information provided by the PMIS ensures the project team members share common facts about the projects thus, reading on the same page on the status quo of the project in cost effective manner [4].

The components of PMIS include: scheduling, resources, project control, estimating, project data and documents, collaborative working and management tools, dashboards and portals, and social media connectivity. The use of PMIS provides optimal benefit to the organization [5]. An important function of PMIS is its ability to track the project progress in terms of actual vs planned completion in identifying future delays using earned value analysis which indicators like Variance at Completion (VAC), Complete Performance Indicator (TCPI), and Estimate at Completion (EAC) used in the analysis. According to Iyer (2021) [6] a PMIS is built to assist in successful project management which entails monitoring of information, data collection, and storage. The PMIS covers areas including: project cost management, project scope, stakeholder engagement, project risk management, project quality management, team communications, integrations and applications.

Measurement of progressive project performance is important in predicting the project outcome be it success or failure. Performance measurement is a central management

function that quantifies both effectiveness and efficiency of any action [7]. Generally, the major accepted success criteria in projects are time, cost, and quality which are major factors as far as performance measurements of a project is concerned. Cost performance is the degree that promotes the completion of a project within the estimated budget. Time performance measures the degree to which a project's time objective is achieved, measured on before or after. Quality performance measures the degree to which a project's quality objective is attained which is subjectively measured based on a given standard [8].

II. STATEMENT OF THE PROBLEM

Community based projects globally are catalysts for development in the society. Most community-based projects in Kenya experience major life-cycle obstacles and hardly go past the implementation phase. Performance of CBO projects in Kenya remains wanting as financing, environmental constraints, poor project management, and lack of technical expertise limit the performance. Studies have shown that performance of community-based projects have been affected by lack of technical capacity in dealing with projects, poor project governance and leadership, lack of stakeholder participation, poor information quality produced during project implementation, poor report and communication, lack of stakeholder ownership and commitment leading to project failure, coupled by poor project design, planning, implementation, monitoring and action taken [9], [10]. Failure to adopt PMIS in Community Based organizations lead to delayed decision making, underutilization of organizations resources, and poor planning which affects the overall performance of the project [11].

Most of community-based organization projects (65%) in Nyeri County fail due to inadequate utilization of PMIS [12]. In the information technology (IT) industry, Oxford Analytica. (2021) estimates that 75% of large IT projects managed with the support of a project management information systems will succeed, while 75% of projects without such support projects will fail. In Nyeri county most CBOs projects (80%) are performed on traditional system. In traditional system all project activities are managed through hard copy files. Most of time project components are not clearly communicated with each other. Furthermore, no proper planning, controlling, analyzing and forecasting is possible in this system, so such a system is prone to failure [4]. Further, traditional system is not enough capable to integrate all project team members, stake holders, resources, processes and activities in a single platform to enhance project performance and project success rate.in this 21st century project managers cannot afford delays, losses, and disappointments due to projects redundancy [12].

A. Objectives of the Study

To establish the influence of PMIS integration on the performance of Community-Based Organizations in Nyeri county.

Specifically, the study aimed to:
   i). Evaluate the role of Quality Information Management on the performance of CBOs projects in Nyeri County.

ii). Examine the influence of Project Planning on the performance of CBOs projects in Nyeri County.

III. LITERATURE REVIEW

Technology Acceptance Theory
The technology acceptance theory was conceptualized by [13] to help predict the intention of an individual in using and accepting Information Technology (IT) and systems. The theory is grounded in the Theory of Reasoned Action (TRA) [14]. The determinants of this theory include; Perceived Usefulness (PU) which is the extent to which an individual considers that the use of specific information will eventually improve performance; Perceived Ease of Use (PEOU) which denotes the extent to which use of a system by an individual will require minimal effort. An Information system (IS) will be successful only if both PU and PEOU are achieved in a given system [15].

This theory postulates that PMIS usage is determined by the system's use intention, where the use intention is jointly determined by a person's attitude toward using the system and its perceived usefulness [16]. According to the theory, PMIS gives an opportunity to project managers to increase the performance of the projects they are undertaking and has a direct effect on the success of the project. In this study, this theory focuses on adopting PMIS leading to project success and enhancing the project's quality. A good PMIS quality enhances information quality and subsequently affects project decision-making. This theory was useful in explaining the variable of PMIS integration and its influence on the Performance of CBOs projects.

IV. CONCEPTUAL FRAMEWORK

This study's conceptual framework sought to demonstrate the relationship between PMIS integration and Performance of CBOs in Nyeri County, Kenya. The conceptual framework is illustrated in Fig I below:
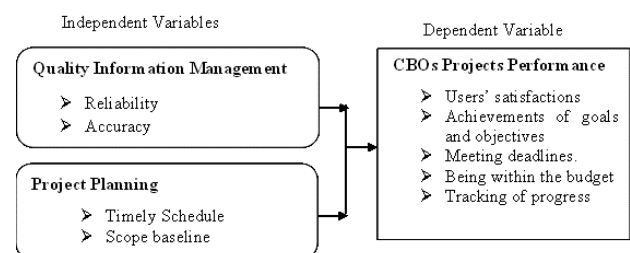

Fig I: Conceptual Framework

A. Quality information Management
The quality of information is that desirable system output characteristics [17]. Information system output ought to be: relevant to the purpose, easy to understand, complete, concise, detailed, and accurate. PMIS provides project managers with essential information on the cost, time and performance parameter of a project and how these parameters interrelate [18]. Organizations that are engaged managing many projects are faced with many challenges which include monitoring, resource planning, prioritization, balancing of scare resources and others which pile the pressure on the management team. Thus, too much pressure leads to poor quality of information and also affect the project completion time. The amount of

information available overwhelms the manager and thus, they are unable to identify the information that is relevant to make an informed decision since the information is also inaccurate [19]. The authors of the accepted manuscripts will be given a copyright form and the form should accompany your final submission. However, the use of PMIS is a solution and beneficial to project managers due to its' contribution in regard to timely decision making and also improvement on performance. Studies on the use of PMIS in projects reveal that there are many factors that prompt project managers to use PMIS however, the decision is mainly based on the information that will be generated [20].

B. Project Planning

Project planning is considered as one of the components of project delivery process and use project performance as the basis of evaluating its effectiveness. Project planning is identified as a key tool that stakeholders use to ensure that projects are successful. Project planning is the systematic arrangement of project resources in the best way so as to achieve project objectives [2]. In project planning, information provides the basis for generating of plans, projection, schedules, network diagrams and some other planning elements. Project planning establishes methodology and structure for management of information resources which entail definition, structuring, review, control and organization as well as provide a focal point for project information policies [21].

During the planning phase a PMISs can be useful in in-depth project scheduling and critical path analysis of tasks. It also supports budget and cost management which entails setting up of cost controls, Key performance Indicators (KPI) metrics as well as the budget analysis. The PMIS also is useful for the execution of resource plan for the entire project and coming up with a contingency plan for future use [6]. According to [5] project scheduling forms the basis for control the project and is communicated to the various stakeholders to ensure continuous measurement. The software scheduling tools in a PMIS are essential component to allow efficient and quick performance of the scheduling function since it very rare that project success is not influenced by project schedule. A good PMIS also tracks the estimated cost of the task of the projects as well as provides justification of the estimates. Sophisticated PMIs have provisions of components like resource calendars that are used in specifying the available resources or even resources breakdown structures (RBS) [5]. The PMIS is also useful for establishing the baseline metrics for the scope, cost, and schedule.

C. Performance of Projects

Project performance can be defined as the capacity to achieve project goals within budget and time and maintain outcome of an intervention over time [22]. Though, in most academics and research works uses this approach to forecast improving project and sustaining a healthy economic, environmental and social system for human development. Three main pillars for CBOS projects performance are economic goals, environmental protection and social equality [22]. Performance measurement is a method for collecting

and reporting information related to a project's inputs, effectiveness and efficiency. The measurements are important for forecasting, controlling, and tracking of the variables to ensure project success. There is a link between project success and project objectives with project performance where the overall project performance is an aggregate of individual objectives performance [8]. Thus, project performance entails evaluating the performance that is relative to project success in terms of cost, quality, and time and form the basis of project success [7].

PMIS is considered important in achieving the project goals and also ensuring the implementation of project strategies [18]. Empirical literature on PMIS has been limited to describing the PMIS software usage based on the characteristics and specific applications of the systems in supporting project management tasks. These tasks include planning, scheduling, controlling costs, and estimating. However, PMIS usage has also been found to have limitations and drawbacks theoretically and practically as compared to the ideal PMIS explained by many scholars and project managers [16].

In a PMIS, the project performance indicators tracking system is useful in storing the indicators in the database and coding the status of the project into successfully accomplished, being achieved, expressing minor problems, experiencing major problems and requires rescheduling of target date, and not yet done. As events occurs, the project manager updates he status of the indicators, records the action to be taken as well as any other comments. the reports are automatically produced at end of each reporting period with all up-to-date information about the project [23].

V.   RESEARCH METHODOLOGY

A.   Research Design

This research study used descriptive research design. Descriptive research is guided by research questions and focuses on the frequency with which something occurs or the relationship between variables. The study adopted a descriptive survey design.

B.   Target Population

The population for this study comprised of 117 registered CBOs in Nyeri County as per the list of registered CBOs in 2020 who are involved in community projects. The unit of observation comprised of project managers, project officers, and selected CBOs officials. Thus, 3 representatives from each CBO were selected giving a total of 351 respondents. Yamane formula was used to determine the sample size since the population was less than 10,000 [24] which was 186.

VI.   RESEARCH FINDINGS AND DISCUSSIONS

A.   Descriptive Statistics

The study analyzed the descriptive statistics in order to ascertain the objective of the studies have been achieved. The study used frequencies, percentages, mean and standard deviation. The responses are from the Likert scale of 1-5. The statistics are as follows per study variable.

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i). Quality Information Management

The first specific objective of the study was to evaluate the role of Quality Information Management on the performance of CBOs projects in Nyeri County. From Table 1 below, the average for the variable was 3.93 and the standard deviation was 1.326. The statistics provided significant statistical evidence to suggest the influence of Quality Information Management on performance of CBO projects. The standard deviation of 1.326 indicates that the responses didn't vary to a great extent.

Table I: Quality information Management

	SD	D	N	A	SA	Mean
With the use if PMIS relevant information is generated.	36	10	16	49	30	3.19
The PMIS gives accurate information about the project	8	21	19	28	65	3.86
Adequate information is produced by the PMIS	9	23	17	20	72	3.87
There is consistency in information generated by the PMIS	13	21	27	55	25	3.41
There is timely generation of quality information by the PMIS	20	22	19	50	30	3.34
Precise information about the project is generated	28	14	21	52	26	3.24
PMIS provides project managers with essential information on the cost, time and performance.	7	26	35	44	29	3.44
Average						*3.93*

The descriptive statistics from Table 1 above indicate that respondents agreed (79, 56.1%) that the use of PMIS has ensured relevant information is generated. Respondents (93, 65.96%) also agreed that PMIS gives accurate information about the project. Further adequate information was found to be produced by the PMIS as agreed by majority of the respondents (92, 65.3%). Consistency information is also generated by the PMIS (80, 56.8%) and also timely quality information (80, 56.8%). The study also found that precise information about the project is generated (78, 55.3%). Finally, the study also found that project managers are provided with essential information on cost, time and performance from the PMIS (73, 51.8%).

The study concurs with the findings of [18] who in their study of the influence of PMIS attributes on project performance of Youth polytechnic development projects in Embu County revealed that the use of various function tools in PMIS for planning, reporting, and controlling has helped to

increase the likelihood of projects performance due to the quality of information that has been generated. Without the right data, there is little control over project managers over their projects [25].

ii). Project Planning

The second specific objective of the study was to examine the influence of PMIS Project Planning on the performance of CBOs projects in Nyeri County. From Table 2 below, the average for the variable was 3.35 and the standard deviation was 1.478. The statistics provided significant statistical evidence to suggest the influence of Project Planning on performance of CBO projects.

Table II: Project Planning

	SD	D	N	A	SA	Mean
PMIS has helped to come up with the project plans that are clear and elaborate.	.46	28	22	14	31	2.69
PMIS has been useful in developing the project scope	15	27	12	24	63	3.66
The project schedule has been easily developed by the use of PMIS	9	30	29	28	45	3.50
The project schedule has helped to ensure easy project of changes and is easily updated	11	24	42	48	34	3.50
The PMIS has helping cost estimation and Cost Planning.	27	9	11	50	44	3.53
Procurement plans that are clear and elaborate have been developed easily due to the use of PMIS	27	10	8	44	52	3.60
The PMIS has been useful to come up with a clear WBS of the project which has improved the performance of the project.	38	9	10	37	47	3.33
The PMIS provide a calendar of activities and a reminder for goods or services that are critical to the projects.	44	15	25	14	43	2.98
Average						*3.35*

From Table II above, respondents disagreed (74, 52.5%) that PMIS has helped in coming up with clear and elaborate project plans. Though the PMIS has been useful in developing of the project scope (87, 61.7%). Further, with the use of PMIS it has been easy to develop the project schedule (73,

51.8%). The study found to PMIS to help ensure easy to make changes to the projects as well as update (82, 58.1%). The study also found the PMIS to help in cost estimation and planning (94, 66.7%). The PMIS has also helped ensured develop procurement plans are clear and elaborate (96, 68.1%). The study also found that the PMIS has been useful in coming up with a clear WBS and thus improving performance (84, 59.5%). However, the respondents disagreed that the PMIS provides calendar of activities as well as a reminder of goods and services that are critical to projects (59, 41.8%) while (57, 40.4%) agreeing.

PMIS can be very useful in the planning phase in project scheduling and critical path analysis of tasks as well as supporting budget and cost management and the budget analysis. The PMIS also is useful for the execution of resource plan for the entire project and coming up with a contingency plan for future use [6]. The software scheduling tools in a PMIS are essential component to allow efficient and quick performance of the scheduling function since it very rare that project success is not influenced by project schedule. The PMIS is also useful for establishing the baseline metrics for the scope, cost, and schedule. Software scheduling tools form a critical component of a PMIS to allow scheduling function to be performed efficiently and faster, easy projection of the potential changes of schedule impact on the project [5].

iii). Performance of CBOs Projects

The main objective of the study was to establish the influence of PMIS on the performance of Community-Based Organizations in Nyeri county. From Table III below, the average for the variable was 3.56 and the standard deviation was 1.263. The statistics provided significant statistical evidence to suggest the influence PMIS on performance of CBO projects in Nyeri.

Table III: Performance of CBOs Projects

	SD	D	N	A	SA	Mean
PMIS use has helped in reduction of cost and cost management.	14	16	21	50	40	3.61
PMIS has helped ensured timely completion of projects	23	18	19	56	25	3.30
The clients are satisfied how the project has been performed.	17	12	17	69	19	3.43
PMIS has ensured timely and fast communication of the project progress	7	12	12	69	41	3.89
PMIS has helped to ensure projects adhere to the planned budget.	23	15	25	45	33	3.35
The projects are of high quality	18	11	25	45	42	3.58
Progress reports that are easily shared through the PMIS have been made available	8	17	32	31	53	3.74
Average						*3.56*

Findings from Table 3 reveal that PMIS use has helped in cost reduction as well cost management (90, 63.9%). PMIs has also ensured timely completion of projects (81, 57.4%). The clients are also satisfied on how the project has performed (88, 62.4%). PMIS has also ensured timely and fast communication of project progress (110, 78%). PMIS has also ensured the projects adhere to the project budget (78, 55.3%). The study also found the projects are of high quality (87, 61.7%). Finally, project progress reports are easily shared through the PMIs have also been made available (84, 59.6%).

VII. CORRELATION ANALYSIS

Pearson correlation coefficient (r) was used to determine the relationship, the direction of the relationship as well as the magnitude between the independent variables (Quality information Management QIM, Project Planning PP) and CBOs project performance (CBOs PP). Table IV below shows the correlation matrix.

Table IV: Correlation Matrix

		QIM	PP
CBO Projects Performance	Pearson Correlation	.190*	.291*
	Sig. (2-tailed)	.024	.000
	N	141	141

Quality Information Management (r = .190, P-value = .024) the variable had a weak correlation with Performance of CBO projects as the r (.190) nears zero. However, the relationship was significant as the P-value = .024 < 0.05. Further, Quality Information Management was directly related to Performance of CBO projects and thus, a unit increase in PMIS Quality Information may lead to an increase in CBO project performance too. Project Planning (r= .291, P-value = .000) the variable had a weak correlation with Performance of CBO projects as the r (.291) nears zero. The relationship was also significant as the P-value = .000< 0.05. Further, Project Planning was directly related to CBO project performance and thus, a unit increase in Project Planning may lead to an increase in Performance of CBO projects.

VIII. ANOVA

The ANOVA was used to determine whether the model was a good fit for the data. The p-value of the F- ratio generated should be less than 0.05 for the equation to be statistically significant at 5% level of significance. Table 5 below shows the results.

Table V: ANOVA Test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	699.981	4	174.995	35.672	.000[b]
	Residual	667.216	136	4.906		

Total	1367.197	140

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716 a	.512	.502	3.80270

a. Dependent Variable: Performance of CBO projects
b. Predictors: (Constant), Quality Information Management, Project Planning, Capacity Building, and Project Resource Management.

From Table 5 above the F-Statistics (4, 136) = 35.672 p-value = 0.00 < 0.05. The F-Critical (4, 136) = 2.438. F-Statistics (35.672) > F-Critical (2.438) this implies that at least one of the predictor variables in: (Quality Information Management, Project Planning, Capacity Building, and Project Resource Management) is fit and significant to explain the change in Performance of CBO projects in Nyeri County.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	13.910	2.559		5.435	.000
QIM	.017	.063	.022	.271	.011
PP	.072	.047	.118	1.547	.012

Multiple regression analysis was preferred for this study because the dependent variable was used to test significance of the independent variables.
Table VI: Regression Results

a. Dependent Variable: Performance of CBO projects

From Table VI above Quality Information Management p-value (0.011), Project Planning p-value (0.012), Capacity Building p-value (0.016), and Project Resource Management p-value (0.000). All the predictor variables had their p-values less than the threshold of 0.05 this implies that they are significant in the model. The beta coefficients of the variables were: Quality Information Management (β = 0.022), Project Planning (β = 0.118), Capacity Building (β = 0.005), and Project Resource Management (β = 0. 525) and the value of the constant is 13.910.

From the table VI above, Quality Information Management influences performance of CBO projects by 0.022, Project Planning by 0.118, Capacity Building by 0.005, and Project Resource Management by 0.525. From this, Project Resource Management had the highest influence on performance of CBO projects (52.5%) followed by Project Planning (11.8%), then Quality Information Management (2.2%) while Capacity Building (0.05%) had the least influence.
The model was fitted as follows:

CBO PP = 13.910 + 0.017 QIM + 0.072 PP …..(i)

IX. MODEL SUMMARY

Thus, in this study, PMIS (Quality Information Management, Project Planning, Capacity Building, and Project Resource Management) only explains 0.512 or 51.2% of variation in Performance of CBO projects in Nyeri County.

Table VII: Model Summary

X. CONCLUSIONS

This study concludes that PMIS significantly influence performance of CBO projects in Nyeri county. Organizations that are engaged managing many projects are faced with many challenges which include monitoring, resource planning, prioritization, balancing of scare resources and others which pile the pressure on the management team. PMIS provides a solution and beneficial to project managers due to its' contribution in regard to timely decision making and also improvement on performance.

1) Quality Information Management and Performance of CBO projects
This study also concludes that Quality Information Management has significant positive influence on performance of CBO projects in Nyeri county. PMIS provides project managers with essential information on the cost, time and performance parameter of a project and how these parameters interrelate. The quality of information is that desirable system output characteristics. The quality of information is useful in making decision in a project which can affect the project outcome. Information that is inadequate is misleading and yields wrong decisions which may affect the project negatively. Quality information is available, accurate, consistent, and precise.

2) Project Planning and Performance of CBO projects
It was evident form the study that Project planning is significant to performance of CBO projects in Nyeri county. Project planning is considered as one of the components of project delivery process and use project performance as the basis of evaluating its effectiveness. In project planning, information provides the basis for generating of plans, projection, schedules, network diagrams and some other planning elements. During the planning phase a PMISs can be useful in in-depth project scheduling and critical path analysis of tasks. It also supports budget and cost management which entails setting up of cost controls, Key performance Indicators (KPI) metrics as well as the budget analysis. The scheduling tools in a PMIS are essential component to allow efficient and quick performance of the scheduling function and it is very rare that project success is not influenced by project schedule.

XI. SUGGESTIONS FOR FURTHER STUDIES

This study considered the influence of PMIS on performance of CBO projects in Nyeri county. The study only considered on three aspects of PMIS: Quality Information Management, project planning, Capacity Building and Project resource management. There are other aspects related to PMIS that can also be considered that also influence performance of projects. Thus, the study recommends similar study to look at the other aspects that account for the 48.8% variation in performance of CBO projects. Studies can also be done on CB) projects in other counties to affirm or critique the current study findings.

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