

# Project Management Information System and Performance of Early Childhood Development Education Construction Projects in Uasin Gishu County, Kenya

Jenner Akwale, Dr. Muchelule Yusuf

**Abstract**—Projects have become complex in the perspective of technology and the organization. With the limited resources available and conflicting goals thus, project managers have to make decisions that are fast to adopt to the changes in the field of project management. The use of PMIS as a tool for gathering, integrating and dissemination of information to support planning, management, and control of complexity in projects. The study aimed to assess Project Management Information System (PMIS) and performance of building projects in Uasin Gishu county. Specifically, the study will try to: Establish time management on the performance of building projects in Uasin Gishu County; Investigate the influence of scope management on the performance of building projects in Uasin Gishu County. The study was underpinned by the Technology acceptance model. The study targeted 257 Early Childhood Development Education (ECDE) construction projects in Uasin Gishu county between 2013-2022. A sample of 157 projects was used for the study where a total of 157 study respondents that are involved in ECDE construction projects were administered with questionnaires. The study conducted both descriptive and inferential analysis on the data that was collected by a questionnaire. The findings were analyzed, discussed, and presented using diagrams and tables. The study found that PMIS significantly influenced ECDE construction projects performance in Uasin Gishu county. The study found time management and scope management to have insignificant influence on ECDE construction projects performance. The study also found time management with the highest influence (12.9%), then scope management (-3.9%). Scope management was found to have a negative insignificant influence on ECDE construction projects performance. All the independent variables related to PMIS can only account for 13.4% variation in project performance. The study thus, recommends similar studies to be done in other counties and sectors to explain the variation in performance and also ascertain the results of this study. The study recommends fully integration of PMIS to enable project managers improve performance of their projects.

**Index Terms**—PMIS, Time Management, scope management, ECDE construction projects

## I. INTRODUCTION

Project management is a diverse process that involves project initiation, planning, execution monitoring, controlling and closure. Projects management tools are most often used

in software development, information technology (IT), research and development (R&D) and business process reorganization [1]. In the current world, to enhance efficiency in project management then project management information systems (PMIS) is applied in most cases. PMIS enhances project success by about 75%. Hence uptake and integration of PMIS becomes very key [2]. Equally, with increased global competition and the resulting pressure on delivery of projects in a faster and effective way, there is need for adoption of smart technologies. As such, how the projects are structured and the manner in which the project is carried out requires that smart PMIS is adopted. PMIS is an important tool in project management because it streamlines data management that is essential for planning, performance monitoring to increase efficiency in completion of the projects [3].

Studies by [4] evaluated five case studies which found PMIS to have advantages such as correct decision making based on visibility of accurate project performance data and improved project performance by increasing communication through the aid of PMIS. Software can make project management easier by simplifying and/or automating the execution of various project tasks [5]. Smart PMIS applications enable project managers to spend less time on repetitive rule-based tasks, enabling the project managers to spend more time focusing on higher order functions such as innovation, creativity, stakeholder relations and strategy. The world has evolved into a digital era i.e., the 4th Industrial Revolution or Industry 4.0, which is characterized by businesses utilizing digitization, automation and information and communication technology in increasing measure [6].

Projects are becoming increasingly technically complex with more pressure to complete the project in less time and at a reduced cost. This is mainly due to increased competition and stakeholder expectations. Engineering companies generally manage several different projects simultaneously. This makes the task of monitoring and controlling multiple projects difficult. Data from PMIS is generally fragmented because it comes from different software applications and sources. In most cases the data is captured manually, and the data is manually imported and exported between software applications. This is a laborious and time-consuming process which is prone to errors. The lack of quality live data and real-time reporting can negatively impact strategic decisions, risk exposure, resource planning, profitability, and stakeholder relations in projects. The existing commercially available PMIS systems as well as the conceptual models

Jenner Akwale, Masters Of Science In Project Management, Jomo Kenyatta University Of Agriculture And Technology, Nairobi, Kenya

Dr. Muchelule Yusuf, Lecturer, Jomo Kenyatta University Of Agriculture And Technology, Nairobi, Kenya

# Project Management Information System and Performance of Early Childhood Development Education Construction Projects in Uasin Gishu County

found in the literature do not address all of these issues in one system or conceptual model” [7].

## A. Statement of the Problem

Construction projects are successful when they are done within the stipulated time, set budget and achieve the set goals as per the desired scope. It is worth noting that construction projects at grass root level are pertinent matters relating to socio-economic development of a nation [8]. In order to implement projects at grass root level, the government of Kenya devolved key functions at county level with the aim of reducing poverty and enhance equity within the nation [9]. As such, studies by [10] indicate that the devolved national resources would then spur economic development at the county level hence enhancing the national economic growth thus reducing poverty. Upon successful devolution, county allocate resources to priority projects that would address their economic needs towards poverty alleviation [11].

“Nonetheless, overdependence on traditional methods of managing building projects in Uasin Gishu County has in essence increased poverty due to stalled projects and delayed in completion hence losing the entire essence of devolution. Some of the challenges that face Uasin Gishu County include: over ambitious plan; disbursement of funds from national treasury; inadequate funding for proposed projects; operational challenges; and poor planning for projects [12]. According to the Auditor General, 2019 the objectives of the building projects were not achieved and no value for money had been obtained on the total expenditure of Ksh. 69 million. For example, Ziwa Health Centre stalled at a completion rate of 4% having spent Ksh. 3.5 million [13]. Subsequently, Uasin Gishu County set out a County Integrated Development Plan (CIDP) whereby construction and rehabilitation of government buildings were given a priority [14]. However, the total recurrent expenditure is 3 times higher than development expenditure indicating misplaced priorities as per the CIDP.”

Further analysis of development expenditure as a proportion of approved annual development budget shows that Uasin Gishu county has 20.9% which is far much lower than other counties such as Kitui County which had 48.8% [15]. According to studies by [16] such low absorption of budget is an indication of poor resource allocation, poor budgeting and inefficient monitoring and control tools. To this effect, with PMIS being used by project managers in all types of industry, the researcher intends to investigate the characteristics of PMIS that contribute to project performance. Thus, the purpose of this study is to explore integration of PMIS on performance of ECDE construction projects in Uasin Gishu County.

## General Objective

To assess the relationship between PMIS and performance of ECDE construction projects in Uasin Gishu County.

## Specific Objectives

The specific objectives of the study are:

- 1) To establish the influence of time management on the performance of ECDE construction projects in Uasin Gishu County.

- 2) To investigate the influence of scope management on the performance of ECDE construction projects in Uasin Gishu County

## II. LITERATURE REVIEW

### A. Theoretical Review

The theoretical framework includes the principles and models that underpin it. The study was guided by the Technology acceptance Model. The Technology Acceptance Model [17] or TAM, suggests two key factors which define the acceptance of a computer system by potential users. The factors are perceived ease of use and perceived usefulness. The key feature of this model is its emphasis on the perceptions of the potential user. That is, while the creator of a given technology product may believe the product is useful and user-friendly, it will not be accepted by its potential users unless the users share those beliefs. TAM theory further suggests that users will be affected through system interaction and their relation to the system. Usefulness is defined as the degree to which a person believes that a given IS will help enhance job performance or ease the work done [18]. An information system (IS) will be successful only if both PU and PEOU are achieved in a given system [19].”

This theory states that the use of PMIS is determined by the intention to use the system, where the intention of use is jointly determined by an individual's attitude towards using the system and its perceived usefulness is determined [20]. As per theory, PMIS gives project managers the opportunity to enhance the performance of the projects they are undertaking and this has a direct impact on the success of the project. In this study, this principle focuses on the adoption of PMIS for project success and enhancing project quality. A good PMIS quality enhances the quality of information and subsequently influences project decision making. This theory will be useful in explaining the variables of PMIS capability and its impact on the performance of construction projects.

## III. CONCEPTUAL FRAMEWORK

This study's conceptual framework sought to demonstrate the relationship between PMIS and Performance of ECDE construction projects in Uasin Gishu County, Kenya. The conceptual framework is illustrated in figure I below.

## IV. REVIEW OF VARIABLES

This section reviews the literature related to study variables.

### i). Time Management

Project time management is an overall component of project management where the timeline is examined and developed for the purpose of a completion of a project or a given deliverable. For project management, time management is crucial as the project team to be well organized to ensure deadlines are met to enable quick collaboration [21]. The [22] identifies six activities related to project time management which include: activity definition, activity sequencing, estimating resources, activity duration

estimation, development of project schedule, and controlling of schedule. One of the biggest challenges is project management faced by project managers is time. As an element of the triple constraint (cost, time, and scope) time cannot be managed on its own without an effect on the other constraints. In fact, time is considered to have the least option of flexibility. In most instances' conflicts arise in projects due to schedule issues. For example, there is always conflicts between contractors and consultants relating to schedules.

The activity definition process ensures the project team identifies and schedules the activities as well as the tasks the are to be done thought out the project life cycle. These activities and tasks are required to ensure timely project deliverables. The tools and techniques used for define activities entail expert judgement, templates, decomposition and roll waving planning. This process thus, is important for identifying those specific activities that project stakeholders and project team members need to perform to ensure project deliverables are produced. In activity sequencing the project manager introduce task dependencies i.e., the order in which tasks must be completed and deliverables achieved. This process identifies and documents the relationships between project activities as mandatory, discretionary, and external dependencies. In order to use crucial path analysis for this process, the dependencies must be determined. Project network diagrams are some of the tools that are used for this process to show the precedence relationships among activities in a project. they are also helpful in showing the flow of work in the projects and further, act as important tool for project planning and control as well as scheduling” [7].

“An important activity relate to project time management is resources estimation. In this process resources are defined and identified. The resources include: materials, machines, and people that are required to ensure deliverables are completed. In a project there are various time management tools that are used. The tools used vary basic to modern tools used in project management and are related to technology. There has been a wider implementation of PMIS within project management where most of these tools are used in many processes of time management and ensure their effective time management during the life cycle of the project. examples of the time management tools used in construction project include timesheets, resource levelling, time recording and control tools, planning and estimating tools, and collaborative tools. Resource levelling is an important tool used to ensure effective time management more so during the planning stage. The tool is crucial to ensure maximization of resources and effectiveness. Software such as Primavera and Microsoft Project are good examples of software that can easily be used” [23].

### *ii). Scope Management*

Project Scope is inclusive of high-level features that the project team is committed to deliver to customers. Project scope is defined by the project sponsor, executive sponsor, steering committee, project's customers and other stakeholder. The project scope is useful in identifying the project objectives of the activities that will be performed and those activities that will not be included in the project. the project scope document is important for development of the

master schedule which helps identify important activities and dates [24]. Analyzing and understanding project stakeholders is an important step in scope planning process. Diligent scope planning aims at ensuring key project stakeholders agree of the project work this is achieved through communicating the project documentation and thus forming a basis for an agreement between the project team and the customers. Scope planning considers project justification, product description, and project objective. Scope planning process entails 4 primary actions include scope planning, scope definition, scope verification, and scope control [25].

The project scope statement which is extracted from the business document and project charter is the foundation for scope planning. The scope management planning process gives an outline the process on how to define the project scope, verification and control. A scope management plan is I the end result of the scope planning process which the project tea uses for documentation of scope management decisions. It provides the guidance project stakeholders on how to manage and control the project scope throughout the project life cycle. The scope management plan forms part of the project management plan and also act as a subsidiary plan for meeting the needs of the project. The scope management plan also documents how the WBS will be defined and created [26]. Defining the project scope entails sub dividing the project deliverable into smaller components that are easily manageable for components for the development of the WBS to identify the resources as well as the milestone of the project. Major accomplishments for project definition include: identification of project deliverables, project work components and requirements; accurate estimation of cost, time, and resources requirements; and performance measurement and management of project components [27].

“Scope verification is that process of developing a formal plan to be used for verifying the project scope. It actual defines how the project will be confirmed as well as accepted by the client. The activities for scope verification include testing of project deliverables, examining, and measuring to ensure compliance with requirements agreed upon. The main objective of the cope verification process is to document a plan project deliverables acceptance. The project stakeholders need to sign off the agreed upon acceptance procedure that are clearly outlined in the project management plan and document all the accepted deliverable that the project team need to comply with” [28]. PMIS allows for the documentation of scope and responsibilities for each element of the Work Breakdown Structure (WBS), which organizes and defines the total scope of the project. The various parts of the WBS can have different levels of decomposition. PMIS Change Management module enables the tracking of all changes to the scope. The workflow features make it possible to ensure efficient and auditable review and approval processes. Design or scope changes are segregated from other types of changes in order to clearly identify cost variances caused by changes to scope or design [25].

### *iii). Performance of Projects*

According to PMI (2017) [22] organizations are turning to PMIS to stay ahead of the competitive and chaotic global

economy to ensure businesses deliver the required results. PMIS is useful in aligning the project, the program and portfolio management dictating the project execution at each stage to ensure project management leads to both better results and long-term business value. In project management, discipline starts at the portfolio level as strategic vision drives investments and establishment of value measures [22]. According to [29] one of the major problems facing PMIS usage is management of scope. A scope that is not well define or is ambiguous can be a reason to why project fails. 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 [30].

According to [31] a project can be successful if the objectives attained though it fails in integration of considerations such as cost, time management demands and manpower that were required before the project became successful. Thus, besides considering or seeing a project as successful, it is crucial to consider the other project management factors and integration of the considerations to form one attribute for each and every project. The comprehensive attribute is project performance in the perspective of project manager, project controller, project implementer, and the project planner [5]. Construction projects need a tool for complex project and thus, PMIS has just become a very essential tool for contemporary 21 century project managers to ensure minimal delays, disappointments, and losses resulting from projects that are redundant. There are several factors that drive project manager to use a PMIS including: the quality of information generated, the level of details needed, easy to understand and use, and the nature of project whether it is complex or simple. A for a simple project, project managers do not see the invest benefits in utilizing such system [32]. PMIS is considered important in achieving the project goals and also ensuring the implementation of project strategies [33].

## V. EMPIRICAL REVIEW OF THE STUDY VARIABLES

This section focuses on empirical literature relating to the study variables as follows:

### *i). Time Management and Performance of Projects*

In a case study of selected failed projects in Nigeria by [34] on the determinant of time planning system s in construction firms found that time planning system provides the necessities to make evaluation of what is to be implemented against standards that are pre-established and a corrective action is enforced should the implementation be contrary to the objectives. Project execution is the actualization of a project plan and tracking effectiveness of the plans to achieve the project goal. This study however didn't clearly establish the effect of time planning on the performance of projects.

### *ii). Scope Management and Performance of Projects*

[35] examined triple constraints specifically project scope management and project completion, schedule management and cost management on project completion. A descriptive survey design was adopted in the study and involved quantitative methods. It was established that the relationship was significant between the scope, schedule and cost on project completion of the NGO projects based in Nakuru County, Kenya.

## VI. RESEARCH METHODOLOGY

This research adopted descriptive survey research design. The study targeted 257 ECDE classrooms construction projects and feeder schools undertaken between 2013 and 2022 as reported in the county government development plan 2018-2022 [12]. Thus, a total of 257 projects were targeted. The respondents for the study were project managers and other project officials as these have informative data for the study. 157 projects were sampled. Questionnaires were administered to 157 project managers representing the 157 projects.

## VII. RESEARCH FINDINGS

### *A. Response Rate*

The sample size was 157 project representatives involved in ECDE construction projects in Uasin Gishu County. A total of 157 questionnaires were distributed to respondents in Uasin Gishu County where 132 were duly filled and returned giving a response rate of 84.07%. [36] argue that a response rate of 50% in a study is adequate while 70% and above is excellent.

### *B. Descriptive Statistics*

The descriptive statistics tend to explain the responses for the items in each variable in relation to the objectives of the study. The 5-point liker scale was used where the responses were coded as 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5 = Strongly Agree. The average for each response was then obtained together with the standard deviation. The composite mean for the variable and the standard deviation was also obtained to ascertain the overall response for the variable.

#### *i). Time management*

The first specific objective of the study was to establish time management on the performance of ECDE construction projects in Uasin Gishu County. The interpretation of the responses will try to establish how time management affects the performance of ECDE construction projects in Uasin Gishu County. The responses on the various items for the variable form the statistics shown in Table I below. From the Composite mean of 3.43 and standard deviation of 1.293, we can conclude that there is no significant statistical evidence to suggest the influence Time management as element of PMIS integration on the performance of ECDE construction projects in Uasin Gishu County. The standard deviation of 1.293 further explains of minimal variation in the responses. According to [21] Project time management is an overall component of project management where the timeline is examined and developed for the purpose of a completion of a

project or a given deliverable. For project management, time management is crucial as the project team to be well organized to ensure deadlines are met to enable quick collaboration.

Table I: Time management

Time management Indicators	Mean	Std Dev
The PMIS has been useful to come up with a clear WBS of the project which has improved the performance of the project.	2.68	1.673
The PMIS provide a calendar of activities and a reminder for goods or services that are critical to the projects.	4.25	.984
The project schedule has helped to ensure easy project of changes and is easily updated	4.18	1.222
PMIS has ensured effective time management during the life cycle of the project.	3.27	1.242
PMIS has tools used for activities planning and also recording of the actual involvement of project team in the project activities.	3.04	1.432
Gantt chart and network diagram are used as estimating and planning tools for effective time management.	3.27	1.375
Time management is crucial as the project team to be well organized to ensure deadlines are met to enable quick collaboration	3.30	1.125
<i>Composite Mean</i>	<i>3.43</i>	<i>1.293</i>

From the findings, respondents neither agreed nor disagreed on whether PMIS has been useful to come up with a clear WBS of the project which has improved the performance of the project (Mean = 2.68, Stdev =1.673). Respondents also agreed that the PMIS provides a calendar of activities and a reminder for goods or services that are critical to the projects (Mean = 4.25, Stdev =.984). The respondents also agreed that the project schedule has helped to ensure easy project of changes and is easily updated (Mean = 4.18, Stdev =1.222) However, respondents could not a conclusive decision on whether PMIS has ensured effective time management during the life cycle of the project. (Mean = 3.27, Stdev =1.242)

On whether PMIS has tools used for activities planning and also recording of the actual involvement of project team in the project activities, respondents could also not make a conclusive decision (Mean = 3.04, Stdev =1.432). Further, on whether Gantt chart and network diagram are used as estimating and planning tools for effective time management and whether Time management is crucial for the project team to be well organized to ensure deadlines are met to enable quick collaboration, the respondents could not make a conclusive decision to agree or disagree with the statements as shown by the mean and standard deviations respectively (Mean= 3.27, Stdev = 1.375; Mean = 3.30, Stdev = 1.125).

*ii). Scope Management*

The second objective was to investigate scope management on the performance of ECDE construction projects in Uasin Gishu County. The responses attempt to answer the research question to what extent does the scope management affect the performance of ECDE construction projects in Uasin Gishu County.? The responses for the various items in the variable are shown in Table II below. The composite Mean of 3.36 suggest that there is no significant statistical evidence to explain how scope management can influence performance of ECDE construction projects in Uasin Gishu County. The standard deviation of 1.405 further explains the minimal variation in the responses. [24] argues that Project Scope is inclusive of high-level features that the project team is committed to deliver to customers. Project scope is defined by the project sponsor, executive sponsor, steering committee, project's customers and other stakeholder. The project scope is useful in identifying the project objectives of the activities that will be performed and those activities that will not be included in the project. the project scope document is important for development of the master schedule which helps identify important activities and dates. According to [25] PMIS allows for the documentation of scope and responsibilities for each element of the Work Breakdown Structure (WBS), which organizes and defines the total scope of the project. The various parts of the WBS can have different levels of decomposition. PMIS Change Management module enables the tracking of all changes to the scope. The workflow features make it possible to ensure efficient and auditable review and approval processes. Design or scope changes are segregated from other types of changes in order to clearly identify cost variances caused by changes to scope or design.

Table II: Scope Management

Scope management Indicators	Mean	Std Dev
PMIS scope management has helped to come up with the project plans that are clear and elaborate.	2.56	1.664
PMIS has been useful in developing the project scope	4.18	1.090
The project schedule has been easily developed by the use of PMIS	4.05	1.247
The project scope is useful in identifying the project objectives of the activities that will be performed.	3.26	1.317
PMIS has helped the project sponsor, executive sponsor, steering committee, project's customers and other stakeholder to define the project scope.	3.04	1.464
PMIS allows for the documentation of scope and responsibilities for each element of the Work Breakdown Structure	3.42	1.488
PMIS has made it easy for sub-dividing the project deliverable into smaller components for the identification of the resources and the milestones of the project.	2.98	1.563
<i>Composite Mean</i>	<i>3.36</i>	<i>1.405</i>

## Project Management Information System and Performance of Early Childhood Development Education Construction Projects in Uasin Gishu County

From the findings, respondents neither agreed nor disagreed on whether PMIS scope management has helped to come up with the project plans that are clear and elaborate (Mean= 2.56, Stdev =1.664). Further, the respondents could not conclude on whether the project scope was useful in identifying the project objectives of the activities that will be performed (Mean =3.26, Stdev =1.317). Additionally, no significant statistical evidence was found to suggest whether PMIS has helped the project sponsor, executive sponsor, steering committee, project's customers and other stakeholder to define the project scope (Mean =3.04, Stdev =1.464). The study also didn't indicate whether PMIS has made it easy for sub-dividing the project deliverable into smaller components for the identification of the resources and the milestones of the project (Mean =2.98, Stdev =1.563). However, respondents slightly agreed that PMIS allows for the documentation of scope and responsibilities for each element of the Work Breakdown Structure (Mean =3.42, Stdev =1.488). Respondents also agreed that PMIS has been useful in developing the project scope (Mean =4.18, Stdev =1.090). Finally, respondents also agreed that the project schedule has been easily developed by the use of PMIS (Mean = 4.05, Stdev =1.247).

### iii). Performance of ECDE Construction Projects

The main objective of the study was to assess PMIS and performance of ECDE construction projects in Uasin Gishu County. The descriptive statistics attempted to establish the status of performance of the ECDE construction projects in Uasin Gishu County. Table III below show the results. The Composite Mean of 3.45 indicated that there is slightly agreement that there is improved performance of ECDE construction projects in Uasin Gishu County. The standard deviation of 1.251 further indicated of minimal variations in the responses.

According to [22] organizations are turning to PMIS to stay ahead of the competitive and chaotic global economy to ensure businesses deliver the required results. PMIS is useful in aligning the project, the program and portfolio management dictating the project execution at each stage to ensure project management leads to both better results and long-term business value. In project management, discipline starts at the portfolio level as strategic vision drives investments and establishment of value measures [22]. 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 [30].

There are several factors that drive project manager to use a PMIS including: the quality of information generated, the level of details needed, easy to understand and use, and the nature of project whether it is complex or simple. A for a

simple project, project managers do not see the invest benefits in utilizing such system [32]. PMIS is considered important in achieving the project goals and also ensuring the implementation of project strategies [33]. 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 [20].

Table III: Performance of ECDE Construction Projects

Performance of ECDE Construction Projects Indicators	Mean	Std Dev
PMIS use has helped in cost management to reduce costs (cost performance)	3.19	1.261
PMIS has helped ensured timely completion of projects	3.30	1.364
The clients are satisfied how the project has been performed.	3.13	1.149
PMIS has ensured timely and fast communication of the project progress	3.27	1.393
PMIS has helped to ensure projects adhere to the planned budget.	3.39	1.075
Progress reports that are easily shared through the PMIS have been made available	4.00	1.159
PMIS has ensured reduction of cost.	3.86	1.354
<i>Composite Mean</i>	<i>3.45</i>	<i>1.251</i>

The findings revealed that no significant statistical evidence was found to suggest whether PMIS use has helped in cost management to reduce costs (cost performance) (Mean = 3.19, Stdev = 1.261). Further, no significant statistical evidence was found to explain whether PMIS has helped ensured timely completion of projects (Mean = 3.30, Stdev = 1.364). In addition to that the study did not provide significant statistical evidence to suggest whether the clients are satisfied how the project has been performed (Mean = 3.13, Stdev = 1.149). no significant statistical evidence was fund to suggest whether or not PMIS has ensured timely and fast communication of the project progress (Mean = 3.27, Stdev = 1.393). The study also didn't provide significant statistical evidence to suggest whether or not PMIS has helped to ensure projects adhere to the planned budget (Mean = 3.39, Stdev = 1.075). However, the study found that respondents agreed that progress reports that are easily shared through the PMIS have been made available (Mean = 4.00, Stdev = 1.159). Finally, the respondents agreed that PMIS has ensured reduction of cost (Mean = 3.86, Stdev =1.354).

### C. Correlation Test

Correlation analysis was used to determine the magnitude, significance, and direction of the relationship. Pearson correlation analysis (r) was used to determine the strength of association between independent variables and the dependent

variable (ECDE Construction Project Performance). Table IV

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	16.203	1.963		8.256	.000
1 TM	.119	.116	.129	1.030	.305
SM	-.030	.086	-.039	-.343	.732

a. Dependent Variable: ECDE Construction Projects Performance

below shows the correlation matrix.

Table IV: Correlation Matrix

		PP
ECDE Construction projects Performance (ECDE PP)	Pearson Correlation	1
	Sig. (2-tailed)	
	N	132
Time Management (TM)	Pearson Correlation	.312**
	Sig. (2-tailed)	.000
	N	132
Scope Management (SM)	Pearson Correlation	.218*
	Sig. (2-tailed)	.012
	N	132

From Table IV above the study found a weak positive correlation between Time Management and ECDE construction projects performance. The Pearson correlation coefficient 0.312 depicts a weak positive and a direct relationship with construction projects performance. Further the P-value (0.000) which is below the significant value of 0.05 further affirms a significant relationship between Time Management and ECDE construction projects performance in Uasin Gishu County. Thus, an increment in Time Management may lead to positive increase in ECDE construction projects performance in Uasin Gishu County. Scope Management has a weak positive correlation with ECDE Construction projects Performance in Uasin Gishu county. The Pearson correlation of 0.218 shows a weak association. However, the p-value (0.012) which is below the threshold of 0.05 indicates the significance of the association. The association is positive to indicate a direct relationship i.e. an increase by a unit on any of the variable will lead to an increase in the other. Scope Management as an element of PMIS can lead to a variation of ECDE Construction projects Performance in Uasin Gishu county.

**D. Regression Analysis**

The study carried out a multiple regression analysis to determine the nature of relationship of the model by predicting the dependent in terms of the independent variables using the following linear regression model. The following multiple regression model was used to come up with the results in Table V.

Table V: Regression Results

Findings from regression show that the constant for model 16.203, the beta coefficient for Time Management .119, p-value .305; Scope Management beta coefficient -.030, P-value 0.732; All the beta coefficients for the variables (Time Management, Scope Management) variables were insignificant i.e. the p-values were greater than the significant value 0.05. Thus, individual variables (Time Management, Scope Management) were not significant in explaining the ECDE Construction Projects Performance in Uasin Gishu County. From the unstandardized beta coefficients, the study found that, Time Management explains 0.129 or 12.9% of variation in performance, Scope Management explains- 0.039 or 3.9% of variation in performance. Project scope management was found to negatively influence performance this implies whenever there increase in scope changes, the performance of the projects was negatively affected. Time management and Scope management influenced performance though in this study their influence is not significant. This could imply that there is insignificant of PMIS in those activities of scope management, cost management, and time management in construction projects in Uasin Gishu county. The descriptive had indicated non-compliance on most issues to do with the aforementioned activities and this substantiates these findings.

The study model was fitted as below:

$$ECDE\ PP = \beta_0 + \beta_1TM - \beta_2SM + e_0 \dots\dots\dots(ii)$$

$$ECDE\ PP = 16.203 + 0.119PTM - 0.030PSM \dots\dots\dots(iii)$$

**VIII. SUMMARY OF FINDINGS**

The main objective of the study was to assess PMIS and performance of ECDE construction projects in Uasin Gishu County. The specific objectives that guided the study included to: establish the influence time management; investigate the influence of scope management on the performance of ECDE construction projects in Uasin Gishu county.'

**i). Time Management and ECDE construction projects Performance**

The study descriptive statistics generally did not provide significant statistical evidence to suggest the influence Time management as element of PMIS integration on the performance of ECDE construction projects in Uasin Gishu County. The study found that no significant statistical evidence to conclude on whether PMIS has been useful to come up with a clear WBS of the project to improve the performance of the project; on whether PMIS has ensured effective time management during the life cycle of the project.; On whether PMIS has tools used for activities planning and also recording of the actual involvement of project team in the project activities, respondents could also not make a conclusive decision ; on whether Gantt chart and network diagram are used as estimating and planning tools for effective time management ; and whether Time management is crucial for the project team to be well organized to ensure deadlines are met to enable quick



# Project Management Information System and Performance of Early Childhood Development Education Construction Projects in Uasin Gishu County

collaboration. The study found that PMIS provides a calendar of activities and a reminder for goods or services that are critical to the projects and that the project schedule has helped to ensure easy project of changes and is easily updated. The inferential analysis found a weak positive correlation between Time Management and ECDE construction projects performance. Time Management also was found to have an insignificant influence and explains 0.129 or 12.9% of variation in performance.

## ii). Scope Management and ECDE construction projects Performance

On Scope management, no significant statistical evidence was found from the descriptive statistics to explain how scope management can influence performance of ECDE construction projects in Uasin Gishu County. The findings further revealed that no significant statistical evidence was found to explain whether scope management has helped to come up with the project plans that are clear and elaborate; on whether the project scope was useful in identifying the project objectives of the activities that will be performed; whether PMIS has helped the project sponsor, executive sponsor, steering committee, project's customers and other stakeholder to define the project scope. Further, the study didn't indicate whether PMIS has made it easy for sub-dividing the project deliverable into smaller components for the identification of the resources and the milestones of the project. However, PMIS allows for the documentation of scope and responsibilities for each element of the Work Breakdown Structure and has also been useful in developing the project scope. Finally, the project schedule has been easily developed by the use of PMIS. From the inferential statistics, Scope Management had a positive weak correlation with ECDE Construction projects Performance in Uasin Gishu county. Scope management also had an insignificant negative influence on performance of ECDE construction projects and explained -3.9% of variation in performance of projects.

## IX. CONCLUSIONS

The study concludes that PMIS has positive weak significant correlation with performance of ECDE construction projects in Uasin Gishu county since it all correlates at 0.365. All the elements of PMIS in this study have positive significant correlation with ECDE construction projects performance. However, PMIS only explained 13.6% of variation in performance in Uasin Gishu county. Time management has an insignificant positive influence on performance of ECDE construction projects in Uasin Gishu county. One of the biggest challenges is project management faced by project managers is time. As an element of the triple constraint (cost, time, and scope) time cannot be managed on its own without an effect on the other constraints. In fact, time is considered to have the least option of flexibility. The tools used vary basic to modern tools used in project management and are related to technology. There has been a wider implementation of PMIS within project management where most of these tools are used in many processes of time management and ensure their effective time management during the life cycle of the project. Examples of the time management tools used in construction project include

timesheets, resource levelling, time recording and control tools, planning and estimating tools, and collaborative tools. Scope management has an insignificant negative influence on performance of ECDE construction projects in Uasin Gishu county. PMIS allows for the documentation of scope and responsibilities for each element of the Work Breakdown Structure, which organizes and defines the total scope of the project. The various parts of the WBS can have different levels of decomposition. One of the major problems facing PMIS usage is management of scope. A scope that is not well define or is ambiguous can be a reason to why project fails. Kadebe (2019) [37] found that problems and challenges improve the process of scope management.

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