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PROJECT PLANNING PRACTICES AND THE COST PERFORMANCE OF LOCAL GOVERNMENT PROJECTS IN RWANDA

by

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Abstract:
This paper aims to analyse the influence that Project Planning Practices have on the cost Performance of Local Government Projects in Rwanda, data for the study were collected on the performance of developmental projects carried out in Rutsiro Districts located in the Western Province of Rwanda. For many consecutive years, different project continued to fail achieving their goals and it became costly to the government of Rwanda. Project planning was found to be the key in resolving those problems. The model presented in this paper was based on literature review and the author's experience in project management. The results showed that project planning practices contribute significantly to the cost performance of Rutsiro district projects. The results based on OLS models show that influence of project planning on the project's cost performance was statistically significant and positively related to projects' cost performance.

Keywords: Cost performance, Government of Rwanda, Projects management, Planning practices.

1. Introduction

In developing countries mostly in Africa, there exist observable differences between management of projects in government organisations and in the private sector institutions. According to Lawani (2018) the management of projects and project delivery in developing countries is affected by various constraints related to the social economic status as well as the reigning political environment and will, these constraints are well recognised in the literature and in many countries, they are designing and/or evolving approaches to ensure high quality project performances.

The application of the modern forms of project management have led to great achievement in recent endeavours. Project management involves identifying the most critical and urgent needs, completing the project within time and budget. It was also realized that the accomplishment of project success requires following a set of project management practices (PMP) starting from project initiation to project controlling and closing (PMI, 2004).

The main cause of projects failure to deliver primarily expected results remain in lack of appropriate PMP for successful project delivery (Akande, Olagunju, Aremu and Ogundepo, 2018). Writers like Akuta, Ayodele, Alabi and Rufai, (2009) reported that underlying root cause of project failure emanate from inadequate project planning, insufficient knowledge, unskillfulness, unsuitable application of planning techniques, limited understanding of critical factors for project planning and project success indicators.

Since 2017, Rwanda started to implement The National Strategy for Transformation (NST1), which is, also the Seven Year Government Program (7YGP) and is an effort to speed up the transformation and economic growth and the bridge for the country's crossover from Vision 2020 towards Vision 2050. The development landscape that Rwanda seeks to achieve will be attained through collaboration between the public and the private sectors through execution of various development projects in all domains. Different Local Economic Development (LED) projects will be undertaken to increase the quality of life of all Rwandans through rapid and sustainable economic growth, as well as accelerated poverty reduction and hence, lay the foundation for decades of economic growth and transformation and attain high standards of living conditions for all Rwandans.

With the decentralisation process of Rwandan governance, most of the developmental projects are planned and executed at district level through "Imihigo" as a performance management mechanism (Murasi, 2021). The office of Auditor General (OAG) continue to notice failures and delays in the completion of different projects leading to cost overrun, stoppages of construction projects, abnormal price adjustment and variation orders and

wasteful expenditure related to delay damages paid to contractors. In addition, there is a tendency to increasing cases of idle assets; which concern the failure to putting completed projects into use to serve the intended purpose (OAG, 2021). This current study intends to assess to what extent Project planning is done at Districts level and their contribution towards project cost performance.

1.1.Statement of the problem

Since the initiation of the National Strategy for Transformation (NST1) in Rwanda in 2017, with objectives of speeding up the social economic transformation and a bridge for the country's crossover from Vision 2020 towards Vision 2050; project performance across different public institutions and especially at district level continued to be poor. The report of the office of (Auditor General [OAG], 2021), indicate some failures and delays in the completion of different projects leading to cost overrun, weaknesses in design and execution of civil works, stoppages of construction projects, abnormal price adjustment and variation orders and wasteful expenditure related to delay damages paid to contractors. In addition, there is a tendency to increasing cases of idle assets; which concern the failure to putting completed projects to use and serve the intended purpose causing the government to lose money. In addition, the OAG report indicates that authorities in concerned entities do not understand nor cannot explain the reason behind these failures which makes it rational for this research to investigate whether projects are planned and the influence planning has on performance of District projects. An understanding of the link between project management practice and performance of government projects, this study focused on projects executed in Rutsiro District bearing in mind that this study's findings can also be applied to any District in Rwanda.

1.2.Objectives of the study and research questions

The general objective of this study is to investigate whether project management practices are applied and how they influence project performance for Administrative District in Rwanda and specifically, to evaluate the influence of project planning on the project's cost performance at the level of district. In order to attain desired output of this study, the researcher looked out for the answers to the following questions How does project planning influence projects cost performance of district project?

1.3.Hypotheses

H01: There exist no significant relationship between project planning and projects cost performance of district projects.

2. Literature Review

2.1.The theoretical review

2.1.1. Theory of constraints (TOC)

A constraint is defined as any obstacle whether material or immaterial that can prevent an organization to achieve its goal. this include; people: lack of skilled personnel which limits the organization performance, financial Resources: If not properly utilized, then the project's goal are likely not to be achieved (Nyang'ori, 2012). TOC plays the role to initiate and implement breakthrough improvements through focusing on a constraint that prevents a higher level of performance, further noting that TOC paradigm essentially states that every firm must have at least one constraint (Simatupang and Sridharan, 2004).

Lombardo and Kvålshaugen (2014) argued that there exist four categories of constraint in project management; first is political constraints consisting of defining vision, mission and the scope of projects, second is technical constraints comprising such as competencies technologies, existing infrastructure and natural conditions like geology, landscape and climate, the third category is social constraints such as codes of conduct, personal relationships, organizational hierarchies and accepted or expected behaviours last is administrative constraints concerned with budgets, project schedules, scope, written contractual agreements among others.

The contribution of the TOC to this study is to help the managers to plan and set the strategies overcome such constraints through restructuring some of their fundamental assumptions about how to achieve the goals of their organizations, especially delivering the planned outputs with planned budgets, project schedules and without changing the initial project scope or tasks.

This theory of constraints has its limits, project constraints are not project specific and the different elements of the triple constraints can affect different project based on the type of project, its industry and the environment in which they operate (Mohamud, 2020).

2.2.Empirical review

2.2.1. Project planning Management

Project planning is the very first step in the project lifecycle. PMI suggests that project planners should ideally spend about 20 to 30% of the time required to perform the project work. This is largely more than most project managers spend on project planning in reality. There is a number of reasons behind the rush and we identified three among them, which are the following:

-Some project managers start the planning phase with unrealistic project expectations on mind or the pressure to complete a project in a specified amount of time causing them to either skip or rush through the planning phase.

-In most of cases project managers are Impatient and do gloss over the planning phase heading right into project execution. The outcome of this skip over the most important project management phase likely result into failure and rework, at the very least.

-A lack of better understanding how planning affects the remaining phases of the project and hence its successful execution.

Project planning requires breaking down a larger project into smaller manageable tasks, it is at this stage that the manager assembles a project team, and determine a schedule over which the work is to be completed. During this phase, the planner sets smaller goals within the larger project, they are made taking into account the available capacity to achieve each one within the timeframe.

Project planning should ideally consist of the following steps as suggested by various scholars:

Determine Stakeholders: Though most projects have a stakeholder for whom the work is being done, planning party must identify other smaller secondary stakeholders having into small stake and a highly and specific interest in the project but disproportionately large ability to derail it. example of projects stakeholders in construction project can include users of a building, funders, neighbours, regulatory bodies, general public (Allen, McLees, Richardson and Waterford, 2015)

Establish project goals: Allen et al. (2015) argue that there is a primary goal in mind of project initiator before any project to be initiated, whether to produce a prototype or construct a structure. However, there are usually many secondary goals like taking into account certain stakeholders' requirement to keep them satisfied, finishing within budget, respecting the schedule to finish ahead or in time but also securing more work.

Create the Scope Statement: The scope defines the project by setting its boundaries.

Divide the project into tasks: Work breakdown structure (WBS) or task list helps to make even large project more manageable hence, it is suitable for completing a complex, multi-step project. The WBS divide large projects into small tasks resulting into getting things done faster and more efficiently. (Allen et Al. 2015)

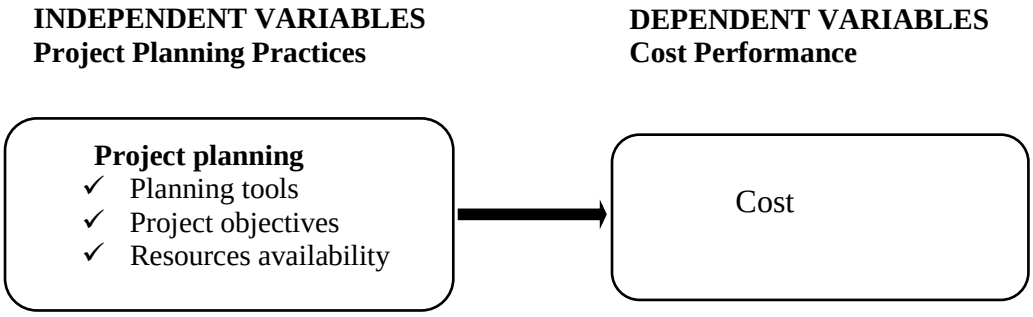
Create the schedule: At this stage of professional project scheduling, each task is given a start and finish dates and a budget is assigned to it. A network diagram determines the critical path and floats, and hence allows the initial schedule to be produced. Lastly, resource levelling determines where, within their floats, each task is ideally placed. (Allen et Al. 2015)

Create the Project Management Plan: A Project Management Plan a comprehensive document that integrates all subsidiary project plans. It defines each of them and set how they are coordinated. The key benefit from this process is a document that defines the basis of all project work (Allen et Al. 2015).

2.3.Conceptual Framework

Following the previous paragraphs describing the theoretical framework, a conceptual framework was developed whereby project management practices were presumed to be the

project management knowledge areas (PMI, 2008) as the independent variables. The independent variable studied herein are Project planning, Project communication, Project stakeholder involvement and Project monitoring and evaluation and how they influence project performance as the dependent variable.



Source: Researcher, 2022

Figure 1: Conceptual Framework

3. Methodology

3.1.Research design

The research design is the conceptual structure within which results is conducted. It constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2004). It stands for advance planning of the methods to be adopted for collecting the relevant data and techniques to be used in their analysis.

The study applied descriptive, qualitative and quantitative research designs. These are particularly appropriate for this research because it gives an opportunity for the problem statement to be studied in some depth within a limited time scale (Bell 1999).

First, the researcher collected qualitative data on the extent of project management practices carried out within the selected district, and their impact on project performance through document analysis. Secondly, qualitative data on the practices were organized into categorical statements and assigned numerical values to enable a quantitative measurement of organisational performance. The effects of the project management practices on measured performance of cases of completed projects will be determined through quantitative analytical methods such as descriptive and inferential analysis. Data for the measurement of project performance were obtained through survey questionnaire.

3.2.Study population, Sampling procedure and sample size

All the items under consideration in any field of inquiry constitute a universe or population. The population is all individuals of interest to the researcher and it refers also to an entire group of individual, events or objects having common characteristics (Kothari, 2004).

The total population was 339 people comprising of District, sector and cell staff as well as Current District Project Managers, the sample was determined by Purposive sampling technique which led to a sample size of 116 respondents.

3.3.Data collection methods and instruments

116 copies of questionnaires in a paper format were distributed to individuals who are willingly to participate in the research. It contained six sections was developed to facilitate data collection. The sections are Section A concerned the respondent's background information, section B concerned Project Planning, section C concerned Project Communication, section D concerned Stakeholder Involvement, section E concerned Project Monitoring and Evaluation and section F concerned Project Performance.

3.4.Validity and Reliability of Research Instruments

Pretesting was done on a group of 32 respondents, which did not participate in the study to avoid bias for having interacted with the questionnaire, the findings of the pilot test showed a Cronbach's alpha value .847 and hence the instrument was reliable.

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
0.847	47

Source: Researcher's calculation using SPSS (2022)

3.5.Data analysis

The data collected was organized, tabulated and analysed using descriptive and inferential statistics. The descriptive statistics analysis was used, to analyse responses made to each research question, while inferential statistics (regression analysis) was used to establish relationship between variables

3.5.1. Descriptive statistics of Project planning and project performance

The first objective was to evaluate the effect of project planning on the project's cost performance of district project. The researcher asked the respondents to show their agreement with statements on evaluating the project planning effect on performance of Rutsiro district projects. Rating of the responses was on a five-point Likert scale in which 1 was strongly

disagree 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. Table 8 illustrates the findings.

Table 2 : Effect of project planning on projects performance

	N	Mean	Std. Deviation
Planning resources are well defined (PRD)	107	3.47	1.152
Regular training of staff (RTS)	107	2.83	1.217
The staff have experience in planning (SIP)	107	3.36	1.223
Stakeholders are involved (SIPS)	107	3.19	1.304
Projects' outputs are well identified (SOI)	107	2.99	1.45
Well defined Project risk and risk responses (PRWD)	107	2.94	1.212
Well defined monitoring and evaluation systems (PMED)	107	2.83	1.363
Project planning lead to cost effective (PPPA)	107	2.98	1.414
Lack of financial backing affects project planning (LFB)	107	3.06	1.4
Resources and time of completion of the project influences project planning (RTCP)	107	3.1	1.394
Resources allocation is essential during project planning process (RAEP)	107	3.42	0.952
Overall mean score	**107**	**3.11**	**1.28**

Source: Researcher Survey Data (2022)

The findings showed that most of the respondents agreed that Rutsiro district applied on project planning to enhance the performance of its project as per the overall mean score of evaluating the project planning effect on performance at 3.11 and a standard deviation of 1.280. More explicitly, following ranking from the least performing, the respective project planning constructs mean scores were as follows; well-designed monitoring and evaluation systems (Mean=2.83), Regular training of staff (Mean=2.83), Well defined Project risk and risk responses (Mean=2.94), Project planning lead to cost effective (Mean=2.98), Projects' outputs are well identified (Mean=2.99), Lack of financial backing affects project planning (Mean=3.06), Resources and time of completion of the project influences project planning (Mean=3.10), Stakeholders are involved(Mean=3.19), The staff have experience in planning(Mean=3.36), Planning resources are well defined (Mean=3.47)

As per the results, the study established that project planning has an effect on the performance of Rutsiro district projects. Planning resources are defined, Stakeholders are involved in the Projects' planning sessions and staff experienced in planning are charged with project implementation to unsure project are cost effective.

3.5.2. Multiple regression

A regression analysis was done to examine the effect / influence and relationship of independents variables on dependent variable by focusing to views of respondents on Rutsiro district Projects. The regression was able to estimate the coefficients of the linear equation involving more independent variables which projected the value of the dependent variable and result was also tested at 95% level of confidence. The regression model is presented as follows:

Y (Cost performance) =f (CF)

Where by: CF stands for cost function,

3.5.3. Empirical Model

This empirical model is built on the ordinary least squares to analyse the linear relationship among parameters. According to Green (1993) the ordinary least square leads to a linear probability model stated as follows: $\gamma it = \beta 0 + \beta' Xit + \varepsilon it$

Whereγ it is the dependent variable; X it is the vector of repressors; β is the vector of coefficients/parameters unknown to be estimated including other variables and ε it is a random disturbance term (error term) which is assumed to satisfy the usual properties of mean zero and constant variance.

The Ordinary Least Square (OLS) method of estimation was adopted in order to obtain the parameters of the model and from mathematical equation the cost factor (**cof)** econometric model was formulated.

3.5.4. Multiple regression analysis

Regression analysis was computed to establish the degree of effect which project planning variable has on each factor of project performance (dependent variable). The discussion of relationship between planning input factors with project planning knowledge areas and project performance factors tested by multiple linear regression model are presented below.

Assume 5% level of significance, and test the following hypothesis: H0: $\beta=0$ ($\approx$ this means that there is no Project planning and time performance) H1: $\beta\neq0$ ($\approx$ this means that there is a relationship between Project planning and cost performance). Below you can see two ways of testing the above hypothesis. We must determine whether we can trust the above coefficient values or if the relationships are caused by natural variation.

Approach 1 (Comparing the t-statistic to a t-table or a z-table): Compare the t-test statistic (for the coefficient β) with a critical value from a t-table (or a z-table under some

circumstances, the number of degrees of freedom for a t-test is computed as: d.f. = number of observations – 1 constant – number of estimated slope parameters in the regression.

H0 is rejected if the (t-statistic) > (t critical value). => We believe in H1.

H0 cannot be rejected if the (t-statistic) < (t critical value). => We do not believe in H1.

In regression, the decomposition of the total sum of squares (SST) into the "explained" sum of squares (SSR) and the "unexplained" sum of squares (SSE) took place in the Analysis of Variance or ANOVA table. However, ANOVA also refers to a statistical technique used to test for differences between the means for several populations. While the procedure is related to regression, in ANOVA the independent variable(s) are qualitative rather than quantitative. In both regression and ANOVA, the dependent variable is quantitative.

As usual, we rely on a hypothesis test to determine if the sample means for the k samples drawn (one from each population) differ enough for the difference to be statistically significant (more than would likely occur due to random chance alone).

Test Statistic:

$$F = \frac{MSR}{MSE}$$

,where MSR = the Mean Square for Treatments, and MSE = the Mean Square for Error Note: MSR is often called MST in the literature and MSR is used to highlight the similarity between regression and analysis of variance. MSE remains the same for both regression and analysis of variance

3.5.5. Model Testing for the Hypothesis

$$cof = \beta_0 + \beta_1 \text{PRD} + \beta_2 \text{ST} + \beta_3 \text{SIP} + \beta_4 \text{SIPS} + \beta_5 \text{SOI} + \beta_6 \text{PRWD} + \beta_7 \text{PMED} + \beta_8 \text{PPPA} + \beta_9 \text{LFB} + \beta_{10} \text{RTCP} + \beta_{11} \text{RAEP} + \varepsilon_0$$

H0: There exist no significant relationship between project planning and projects cost performance of district project.

Table 3 : Project planning and cost performance

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0.036	0.218		0.164	0.87	-0.397	0.468
	PRD	0.196	0.025	0.363	7.921	0	0.147	0.246

RTS	0.179	0.024	0.349	7.593	0	0.132	0.226
SIP	0.157	0.023	0.309	6.716	0	0.111	0.204
SIPS	0.167	0.023	0.35	7.332	0	0.122	0.213
SOI	0.144	0.021	0.335	6.756	0	0.102	0.186
PRWD	0.103	0.024	0.2	4.339	0	0.056	0.15
PMED	-0.013	0.021	-0.028	-0.612	0.542	-0.054	0.028
PPPA	0.057	0.021	0.129	2.711	0.008	0.015	0.098
LFB	0.005	0.02	0.012	0.266	0.791	-0.035	0.046
RTCP	-0.02	0.021	-0.044	-0.962	0.338	-0.061	0.021
RAEP	0.048	0.031	0.074	1.556	0.123	-0.013	0.11

Source: Researcher's calculation using SPSS (2022)

Therefore, in this case, we have 11 degrees of freedom. The critical value for the t-test is 1.796 for 90%, 2.201 for 95%, and 2.718 for 99% (Gujarati, 2004).

- T-Test and ß coefficient (estimate)

Based on table 13, the equation for the regression line is:

$$Cof = 0.036 + 0.363X_1 + 0.349X_2 + 0.309X_3 + 0.35X_4 + 0.335X_5 + 0.2X_6 + -0.028X_7 + 0.129X_8 + 0.012X_9 + -0.044X_{10} + 0.074X_{11} + Ɛ$$

According to the intercept (ß0), when the eleven planning variables are hold constant, the value of cost performance of Rutsiro will be 0.036. Planning resources are well defined (estimate of 0.196, t statistic of 7.921)

The results from table 13 shows that project planning variables: Regular training of staff (estimate of 0.179, t statistic of 7.593), The staff have experience in planning(estimate of 0.157, t statistic of 6.716), Stakeholders are involved(estimate of 0.167, t statistic of 7.332), Projects' outputs are well identified(estimate of 0.144, t statistic of 6.756), Well defined Project risk and risk responses (estimate of 0.103, t statistic of 4.339), Project planning lead to cost effective (estimate of 0.057, t statistic of 2.711) are significant at 95% of confidence level, on the other hand Well designed monitoring and evaluation systems (estimate of -0.013, t statistic of -0.612), Lack of financial backing affects project planning (estimate of 0.005, t statistic of 0.266), Resources and time of completion of the project influences project planning (estimate of -0.02, t statistic of -0.962) and Resources allocation is essential during project planning process (estimate of 0.048, t statistic of 1.556) are not significant by comparing its t-calculated and t-value (t statistic <2.201.).

The results showed that except for well-designed monitoring and evaluation systems (estimate of -0.013, t statistic of -0.612) and Resources and time of completion of the project

influences project planning (estimate of -0.02, t statistic of -0.962) where a negative effect of project planning on cost performance was observed, the rest had a positive effect.

- Adjusted R2 and Coefficient of determination (R2)

The table 14below shows the model summary of the effect of the independent variable on the cost performance of Rutsiro district.

Table 4 : Model summary. Project planning and cost performance

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.905[a]	0.818	0.797	0.281

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.905[a]	.818	.797	.281

Source: Researcher's calculation using SPSS (2022)

By normalizing the model, the percentage of variation was shifted from 81.8% (R2=R square) to79.7% (adjusted R square). The project planning variables studied affect at 79.7% on the cost performance in Rutsiro district as represented by the R2. It means that 79.7% of variation in cost performance were explained by the variation in project planning variables. While the remaining of 22.3% can be attributed to other variables not considered by this study model

Table 5 : ANOVA results of effect of project planning on the time performance

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	33.661	11	3.06	38.869	.000[b]
Residual	7.479	95	0.079		
Total	41.14	106			

Source: Researcher's calculation using SPSS(2022)

The results from table 15 The analysis of variance was used to determine whether the model is a good fit for the data. The Results indicated that the overall model was statistically significant. The project planning variables are the good predictors of cost performance. The P-value or significance value is .000 and F calculated value is 38.869. As the F calculated =38.869>F Critical =1.89 at α =0.05, this means that the model is statistically significance.

H0 (1) is rejected and accept H1, and conclude that there exists a positive significant relationship between project planning and cost performance of district project

4. Findings

The analysis was done using descriptive statistics and regression analysis. The study had a sample size of 116 respondents who had to fill and return the questionnaires and the same number of questionnaires were distributed, 107 of the respondents returned the questionnaires duly filled in contributing to a response rate of 92.2% which was representative and adequate for data analysis and statistical reporting.

4.1 Influence of project planning on cost performance.

The first objective was to evaluate the influence of project planning on cost performance of district projects. The study findings indicated that the Rutsiro district moderately applied planning practices to enhance cost performance of its project with an overall mean score of 3.11. According to the results, the study established that project planning has an effect on the performance of Rutsiro district projects. Planning resources are defined, Stakeholders are involved in the Projects' planning sessions and staff experienced in planning are charged with project implementation to unsure project are cost effective but also results show that regular training of staff and use of well-designed monitoring and evaluation systems are least performing. The study concludes that there exists a positive significant relationship between project planning and cost performance of district project.

4.2 Results from multiple regression

The study based on 4 models to test the research hypothesis by use of multiple regression analysis. The analysis using ANOVA showed that the model was statistically significant and the findings helped to reject the null Hypothesises and only retain its alternate and hence the researcher concluded that there exists a significant positive relationship between project planning and cost performance of district projects;

4.3 Discussions

The results indicated that project planning variable has influence on cost project performance. The findings agreed with (Gido & Clements, 2015) who showed that the successful accomplishment of the project objective could be constrained by many factors, including planning for scope, quality, schedule, budget, resources and risks.

The findings of the study confirm the ones from Mishra (2019). In his work of Assessment of project performance in terms of time cost and quality show that planning in terms of schedule management and human resource management inhibit cost performance.

Memon et. Al (2014). whose study on affecting factors on construction cost performance in MARA large projects revealed that difficulties related to cost and time performance of projects are linked with incorrect planning and lack of communication between parties among other factors.

5. Conclusion

The general objective of the study was to investigate whether project management practices are applied and how they influence project performance for Administrative district in Rwanda while the specifics objectives was to evaluate the influence of project planning on the project's cost performance at district level. The results indicated that the project planning practices were applied and that they influence project cost performance of Rutsiro district projects, and hence, there exist a positive relationship between project planning and projects cost performance.

The researcher concludes that the study was successfully conducted, results achieved, research questions answered, and the research objectives have been attained

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