



PROJECT MANAGEMENT PRACTICES AND OPERATIONAL PERFORMANCE OF RWINTARE-GITANDA-MUVUMO ROAD CONSTRUCTION PROJECT IN RULINDO DISTRICT, RWANDA

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ABSTRACT

The implementation of projects within business is usually undertaken by project managers through different project management practices carried out on a daily basis. This research investigated the effect of management practices in projects on the operational performance of Rwintare-Gitanda-Muvumo road construction project in Rulindo District. It was guided by three specific objectives based on three key concepts, namely, project scope, project communication and project risk management practices on the operational performance of road construction project in Rulindo District. Two main theories were identified in literature that provided the foundation of the argument in this study, namely, the resource-based view theory and the stakeholder theory. Research design was both descriptive and analytical and 110 staff working in Rulindo District office sector and cell offices where the Rwintare-Gitanda-Muvumo road construction passes as the target population. Universal sampling technique was used. Structured questionnaires and interview guide were used in this study to collect primary data. Appropriate tests for validity and reliability of the data instruments were conducted to make sure the research instruments achieved their objectives. The collected data was presented and evaluated by use of SPSS version 22. Out of the 110 distributed questionnaires, 97 were filled and returned. The findings on first objective showed that a total of 90.7% of the participants were in agreement that formulation of project scope is a key feature in project management practices. The results further showed a positive and statistically significant relationship ($r=0.714$, $p=0,000$) between project scope management and operational performance of construction projects in Rwanda. The findings on the second objective showed that project communication practices are very important factors determining the success of road construction projects, a total of 89.7% of the participants were in agreement. On whether the current road construction communication allows all stakeholders to express their opinion about the progress of the project, 58.8% agreed, 13.4% strongly agreed. The correlation analysis showed there is a positive and statistically significant relationship ($r=0.800$, $p=0,000$) between project communication management and operational performance of construction projects in Rwanda. On the third objective, the findings showed that a total of 95.9% of respondents were in agreement that the use of modern risk assessment practices can help the project managers to control for quality and cost overrun of a project. The correlation analysis results showed that there is a positive and statistically significant relationship ($r=0.626$, $p=0,000$) between project risk management and operational performance of construction projects in Rwanda. The regression model ($F=35.301$, $p=0.000$) between project management practices and operational performance significantly affect the operational performance of construction projects in Rwanda. Further, the regression model was found to have a good fit with $R=0.730$ and $R^2=0.532$. This implies that project management influences the operational performance of construction projects by 53.2%. Therefore, project management practices play significant role in the operational performance of projects. The researcher recommends that project managers and donors should make sure that wide consultations are made during the project planning and

designing phase. This would help to ensure that the project scope is well, efficiently and sufficiently formulated.

Keywords: Project Management Practices, Operational performance, Rwintare, Road construction project

1.0 Background of the study

Globally, different authors (Xue, Liu & Sun, 2018; Tereso, *et al.*, 2019) contend that the use of best practices in project management can increase the possibilities of organizations performance in the market. Through the use of best practices, organizations can gain competitive advantage over other organizations and increase their sales returns. In USA, for instance, Project Management Institute (PMI) states that disciplined project management practices have made many companies initiated and complete project that have created value for their investments. Such practices have saved organizations from engaging from projects that are failing. In addition, the PMI holds that best PMPs should be done in such a way that they are incorporated at strategic level in order to encompass the entire organization's vision. The success of projects is therefore pegged on the adoption of best practices in project management. This approach ensures that organizations are within their stated timelines, manage their budget efficiently and remain within the project scope definition.

In Africa, there have been various studies conducted in regards to project management and the project practices, focusing on project deliverables within the time, budget and project scope. For instance, a study by Oyedele (2019) provides empirical evidence on the project management practices in construction projects. The author evidence that in order to realize objectives of a project, namely, scope, quality, time and within a given budget, managers should adopt the best PMPs that include project management in all phases of the project. Rwelamila and Asalan (2018) in their research in South Africa hold that project managers ought to be acquitted and furnished with good project management practices if they are to successfully carry out projects to completion. In Ghana, similar findings are documented by Aboagye, (2022) in their research which emphasizes the importance adopting best PMPs in construction projects.

Across East Africa region, different empirical research carried out in this area have also stressed the significance of project management practices. Kavishe and Chileshe (2018) on their part have carried out research in Tanzania housing projects and showed that PMPs should be integrated in to the project management for successful projects. In particular, the authors identify site visits, inspections and meetings as prominent practices that drive project success. In their research conducted in Kenya, Kaluai and Muathe (2020) have shown that it is imperative to adopt management practices that can successfully propel the projects to success. In Rwanda, Aline, Gamariel and Placide (2022) have shown the need for project management practices for successful performance of projects in the agricultural sector

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The current study was carried out to examine the effect of project management practices on the success of projects in Rwanda in respect to their operational performance. This research was carried out to add value to the body of knowledge that exists by providing insightful empirical evidence within the Rwandan context. In particular, the study covered the Rwintare-Gitanda-Muvumo road construction project in Rulindo District in Rwanda. This construction project was initiated in 2014 and was initially planned to take three years. Yet, the construction is still ongoing five years down the line. This study investigated the problem surrounding the unsuccessful execution of the project which has failed to meet the budget, time and scope in its operation.

1.2 Statement of the Problem

As noted by Abdilahi, Fakunle and Fashina (2020), construction projects that delay in achieving their planned time will lead to cost overrun. At the same time this can compromise the quality of the projects. This research sought to find the significance of project management practices on the operational performance of projects. In particular, the study covers the Rwintare-Gitanda-Muvumo road construction project in Rulindo District in Rwanda. This construction project was initiated in 2014 and was initially planned to take three years and be completed by 2017. Yet, the construction is still ongoing many years down the line. The contracting process is still going on till to date while by February this year, the construction report showed that only 15% of the road was done and work has just started with the Muvumo side of the road (Local Economic Development Report, 2023). This study investigated the problem surrounding the unsuccessful execution of the project which has failed to meet the budget, time and scope in its operation. Based on the challenges mentioned above, this research investigated the effect of project management practices on the operational performance of Rwintare-Gitanda-Muvumo road construction project in Rulindo District, Rwanda.

1.3 Research Objectives

- i). To determine the relationship between project scope management practice on the operational performance of road construction project in Rulindo District.
- ii). To investigate the effect of project communication management practice on the operational performance of road construction project in Rulindo District.
- iii). To assess the effect of project risk management practice on the operational performance of road construction project in Rulindo District.

2.1 Theoretical Framework

2.1.1 Resource Based View (RBV) Theory

The Resource Based View (RBV) theory was introduced in to literature in the 1980s and can be attributed to Wernerfelt (1984). The theory posits that organizations can gain competitive advantage by using the resources they have rather than looking at the external factors. According to this theory, the management can be able to influence the performance of their organizations from within. They can be able to control and coordinate the internal resources to achieve better performance. They do not have control on the external factors that are in the industry or the economy. Therefore, according to this theory, organizations can achieve their goals by focusing on what they have, analyzing their strength and their weaknesses and coming up with working policies that can ensure effectiveness and efficiency in their operation.

As noted by, Edwards (2013) project management practices are crucial in the running of a project. The smooth operation of projects and the achievement of projects goal can be done within the best practices. These practices include scope management practices, communication management practices and risk management practices. However, such practices require necessary resources for them to be practiced. For instance, the project managers will require the right human resource who are skilled and experienced, in order to formulate project scope and plans.

2.1.2 Stakeholder Theory

This theory is attributed to Freeman in 1984, who identifies different stakeholders within a project. According to the stakeholder theory, key stakeholders and peripheral stakeholders represent the people who are directly affected by or who have a direct effect on a project performance. The stakeholder theory posits that the performance of any given project is pegged on the level of inclusion and engagement of the project stakeholders. As such, project can operate efficiently if the key stakeholders are engaged in the project formulation and planning stage, in the project implementation phase, in the project evaluation stage. This means that stakeholders should be included and engaged at all the project life cycle (Parmar, *et al.*, 2010).

2.2 Empirical Literature

2.2.1 Project Scope Management and Operational performance

In Malawi, Banda and Pretorius (2016) conducted their research investigating the effect of project scope definition on the success of infrastructure projects. The findings showed that there is a direct and significant effect of project scope definition on the success in the implementation of infrastructure projects. Further, project that were well defined in their scope tended to succeed than those with no clear scope definition. The project performance indicators like timely delivery, being within the project budget and quality delivery were visible in those projects with clear scope definition. In their study, Radujkovic and Sjekavica (2017) investigate the success factors that are crucial for any project to succeed in Croatia. The authors used desktop approach in their study reviewing different literatures concerning projects success. The authors pointed out that project success is achievable through use of common project practices including project planning, project scope formulation, project monitoring and control as well as effective risk management practices.

2.2.2 Project Communication Management and Operational Performance

Mkutano and Sang (2018) in their study investigated different project management practices that are key to the success of projects initiated by NGOs in Kenya. One of the key areas of concern to the authors is the effect of communication practices on the project performance. The study used descriptive research design, distributed questionnaires to 100 NGOs operating in Nairobi and analyzed the data using SPSS. The research found that communication management practices

along with other project management practices have significant effect on the project success. Communication practices were found to have significant relationship that is also positive ($r=0.521$) with project performance. The implication of these findings is that with effective communication project managers can achieve operational success of their project. Communication practices aid the managers in coordinating the people and other resources towards the achievement of project success.

2.2.3 Project Risk Management and operational Performance

In their empirical study, Carvalho and Rabechini (2015) in their study investigated impact of PRM on the performance of projects in Brazil. The authors used soft skills and hard skills where they involved both literature review and empirical study to achieve their research objectives. Primary data was however collected using interview of project and risk managers based on 263 projects across eight different industries. The research used structural equation modelling and found that the soft skills in risk management have more impact on project success explaining 0.7% of the project success while at the same time supporting the hard skills with a correlation explaining 25.3%. The implication in their findings is that project risk management should use both the soft management skills which are personality traits vis-à-vis the hard skills which are concerned with the technical traits. However, soft skills like time management, communication management, mental agility, interpersonal relation and conflict resolution would benefit the project operational performance to a greater extend

3.0 Research Design

A research design can be described as the various approaches that the researcher uses to go around achieving the research design. In this study, both descriptive and analytical research designs were used. The descriptive research design was used in so far as it helped the researcher to collect and use descriptive statistics to give an overview of the project management practices and operational performance of construction projects in Rwanda. Hence, descriptive statistics used included tables, percentages, frequencies, mean and standard deviation.

The target population was made up of 110 employees working in Rulindo District offices, sector offices and cell offices (District office, 2022). The selection of sectors and cells depended on the Rwintare-Gitanda-Muvumo road construction project which passes through these sectors and cells in the district.

The target population was not significantly larger than 100 and therefore no need for sampling. As such, all the 110 staff in the target population was used in this research.

The researcher used the universal sampling technique which involves the use of the entire target population. In this study, universal sampling technique was used because the target population was not significantly large from 100. In addition, it allowed the researcher to include all the staff working in the district, sector and cell offices in Rulindo district.

This research used both primary sources of data and secondary sources of data to attain the research objectives. In regards to primary data, the researcher made use of questionnaire structured with closed-ended questions/statements and interview guide. The structured questionnaire was used because of its ability to solicit responses from the respondents without necessarily revealing the identity of the respondents. Hence, it gave the respondent freedom to give the best responses because of the confidentiality it assures. In addition, the researcher structured the questionnaire into three sections. Section A covered questions related to the respondents' profile and captured the gender, age group, education background and the work experience of the respondents. Section B dealt with the questions related to research objectives and therefore subdivided into three subsections for each of the objectives. The last section C captured questions relating to the

operational performance of projects in Rwanda, and in particular the Rwintare-Gitanda-Muvumo road construction project in Rulindo District.

The data once gathered using the questionnaires was coded, entered and processed in SPSS to enable for data presentation and analysis. The data presentation and analysis were then using descriptive statistics like mean and standard deviation as well as inferential statistics like correlation and regression. The inferential statistics helped in further analysis of the data in order to measure appropriately the effect of project management practices on the operational performance of projects in Rwanda. Further. multiple regression analysis was used as formulated below:

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \varepsilon$$

Where y = dependent variable (operational performance)

β_0 = constant

β_1, β_2 and β_3 = regression coefficeints for x_1, x_2 and x_3 respectively

x_1, x_2 and x_3 = project scope management, project communication management and project risk management, respectively

4.0 Findings and Discussion

4.1 Descriptive Analysis

Table 4.1: Correlation between Project scope management and operational performance

		Operational Performance	Project Scope
	Pearson Correlation	1	.714**
Operational Performance	Sig. (2-tailed)		.000
	N	97	97
	Pearson Correlation	.714**	1
Project Scope	Sig. (2-tailed)	.000	
	N	97	97

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Researcher (2022)

Table 4.1 demonstrates the relationship between project scope management and operational performance of construction projects. Pearson correlation analysis was used to help achieve the first objective effectively. It helped the researcher to measure whether there is any relationship between project scope management and operational performance of construction projects in Rwanda. It also assisted in testing the first null hypothesis which stated as follows:

As the findings show, a positive and statistically significant relationship ($r=0.714$, $p=0,000$) exists between project scope management and operational performance of construction projects in Rwanda. The correlation is interpreted to be strong positive, and significant at 5% since the p-value is less than 0.05. This implies that project scope management positively influences smooth operational performance of construction projects in Rwanda. Since the p-value was less than 5%, the first null hypothesis was rejected, thereby confirming the alternative that there is a significant relationship between project scope management and operational performance of construction projects in Rwanda. These findings are in agreement with previous studies conducted by other authors. For instance, Banda and Pretorius (2016) found that there is a direct and significant effect of project scope definition on the successful implementation of infrastructure projects

Table 4.2: Correlation between Project communication and Operational performance

		Operational Performance	Project Communication
Operational Performance	Pearson Correlation	1	.800**
	Sig. (2-tailed)		.000
	N	97	97
Project Communication	Pearson Correlation	.800**	1
	Sig. (2-tailed)	.000	
	N	97	97

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Researcher (2022)

In order to effectively achieve the second objective, the researcher went further to conduct Pearson correlation analysis. It also helped the researcher to measure whether there is any relationship between project communication management and operational performance of construction projects in Rwanda. Table 4.8 shows the correlation between project communication management and operational performance of construction projects. The analysis helped the researcher to respond to the second null hypothesis which stated as follows:

As the findings show, there is a positive and statistically significant relationship ($r=0.800$, $p=0,000$) between project communication management and operational performance of construction projects in Rwanda. The correlation is interpreted to be strong positive, and significant at 5% since the p-value is less than 0.05. In addition, since the p-value was less than 5%, the null hypothesis was rejected, thereby supporting the alternative that there is significant effect of project communication management practice on the operational performance of road construction project in Rulindo District

Table 4.3: Correlation between Risk management and Operational Performance

		Operational Performance	Risk Management
Operational Performance	Pearson Correlation	1	.626**
	Sig. (2-tailed)		.000
	N	97	97
Risk Management	Pearson Correlation	.626**	1
	Sig. (2-tailed)	.000	
	N	97	97

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Researcher (2022)

In order to effectively achieve the third objective, the researcher went further to conduct Pearson correlation analysis. It also helped the researcher to measure whether there is any relationship between project risk management and operational performance of construction projects in Rwanda. Table 4.3 shows the correlation between project risk management and operational

performance of construction projects. The analysis helped the researcher to respond to the third null hypothesis which stated as follows:

As the findings show, a positive and statistically significant relationship ($r=0.626$, $p=0,000$) exists between project risk management and operational performance of construction projects in Rwanda. The correlation is interpreted to be moderate, positive and significant at 5% since the p-value is less than 0.05. In addition, since the p-value was less than 5%, the null hypothesis was rejected, thereby supporting the alternative that there is significant effect of project risk management practice on the operational performance of road construction project in Rulindo District

Table 4.4: Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730 ^a	.532	.517	.09322

a. Predictors: (Constant), Project Scope, Project Communication, Risk Management

Source: Researcher (2022)

Table 4.4 shows the regression model summary, where the results of the overall model fit are displayed. As per the finding, the regression model was found to have a good fit with $R=0.730$ and $R^2=0.532$. This implies that project management influences the operational performance of construction projects by 53.2%. Other factors outside the current study influence operational performance of construction projects by 46.8%.

Table 4.5: Analysis of variance (ANOVA) output table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.920	3	.307	35.301	.000 ^b
	Residual	.808	93	.009		
	Total	1.728	96			

a. Dependent Variable: Operational Performance

b. Predictors: (Constant), Project Scope, Project Communication, Risk Management

Source: Researcher (2022)

Table 4.5 shows the output for analysis of variance (ANOVA). As per the findings the regression model ($F=35.301$, $p=0.000$) between project management practices and operational performance significantly affect the operational performance of construction projects in Rwanda. This is indicated by a p-value less than the normal threshold of 5%, hence the regression model was statistically significant at 5%.

Table 4.6: Regression coefficient analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
		1	(Constant)	1.400		
	Project Scope	.154	.041	.270	3.762	.000

Project	.273	.037	.529	7.360	.000
Communication					
Risk Management	.238	.051	.329	4.627	.000

a. Dependent Variable: Operational Performance

SD=strongly disagree, D=disagree, NS=not sure, A=agree, SA=strongly agree

Source: Researcher (2022)

Table 4.6 shows the regression coefficient analysis for each of the indicator variables. It indicates the contribution of each of the variable towards the operational performance of construction projects in Rwanda. Similarly, the output helped to test the null hypotheses to confirm the results from the Pearson correlation analysis. As per the findings, all the regression coefficients were found to be statistically significant since the p-values were less than 5%. For project scope management practice ($\beta_1=0.154$, $t=3.762$, $p=0.000$), the p-value was less than 5% indicating that project scope management has a positive and significant contribution on project operational performance. Moreover, the results meant that the first null hypothesis was not supported. In addition, a one unit change in project scope management practice would increase the operational performance of construction projects by 0.154 units.

5.0 Conclusions

Based on the findings from this study, it is clear indication that project management practices play significant role in the operational performance of construction projects project. More particularly, road construction projects in Rwanda can perform better if the project managers effectively include best management practices within their projects. These would include practices like project scope management, project communication and project risk management practices. The findings further revealed that there is positive and significant effect between project management practices and operational performance of projects. Hence, the researcher concludes that project managers must take care to define and formulate project scope that are wide and inclusive. This would ensure that the project kicks off when all key elements are clearly defined. In addition, project scope is the first planning and designing step that calls for care and prudence. Project managers should consult widely and in particular include experts in designing construction projects. The findings have also shown that the quality of the final project delivered is determined by the project scope formulation. In addition, project communication is without any doubt a key determinant of the operational performance of projects. It is evident from the findings that project plans and designs as formulated in project scope have no meaning unless they are effectively communicated to all project team players. In fact, communication is the connecting factor that enables the plans to be implement successfully. The study has therefore pointed out the important place that project communication practice has in the smooth running of construction projects. It is through communication that project managers can be able to coordinate human resources as well as other resources. Similarly, project risk management is important in ensuring that projects are protected from risky eventualities which tend to disrupt performance of projects, consequently delaying their completion or even compromising the final quality delivered. It is therefore important for project managers to incorporate effective risk management practices as part of the project management. These should include risk assessment, risk control and risk monitoring and evaluation.

6.0 Recommendations

The researcher further recommends that project managers should put different communication channels that allows for smooth and speedy flow of information from one end to another. In

addition, there is need to have a feedback system that allows the project managers receive important information from other parties. The researcher also recommends that project managers must be proactively engaged in risk management practices in order to improve the operational performance of construction projects. The researcher also recommends to the policy makers and other practitioners especially those involved in public works to give value of money to the public they serve. Most of government projects are known to fail in terms of time delays in procuring and planning phases of the project, in executing phase of the project and in terms of time delays. Therefore, based on the findings of this study, the researcher recommends the use of best project management practices that can help making road construction projects successful.

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