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EFFECT OF PROJECT MANAGEMENT PRACTICES ON THE PERFORMANCE OF CONSTRUCTION COMPANIES IN RWANDA: A CASE OF NPD COTRACO LTD IN KIGALI, RWANDA

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ABSTRACT

The project manager's responsibilities are to plan and control company resources efficiently and to complete the project on schedule, within the budgeted costs and specified quality towards making the project a success. However, many reports have shown the opposite results. Studies on this issue are pointing towards the poor understanding of good practice as a basic problem for the failures in project management. The main objective of this study was to assess the effect of project management practices on performance of road construction project in Rwanda with reference to NPD COTRACO Ltd based within Kigali. The research design adopted for this study was descriptive and correlational research designs and quantitative data were gathered using a questionnaire while qualitative information was gathered using interview. The first-hand information was gathered from 200 respondents and was presented in form of tables using frequency, percentages, mean and standard deviations. Informants were selected using purposive and survey/census method. The results on the first objective showed that project planning practices positively impact on the performance of road construction on correlation coefficient of 0.816** and tailed p-value of 0.000 which is less than 0.05

Statement of the problem

Projects performance is based on three pertinent pillars, that is, cost, time, specifications/scope and also satisfaction (Hutton & Bartram, 2018). This has to do with management practices and the environment within which projects delivery teams operate. Many construction projects frequently fail to realize their objectives owing to either their organizational or managerial problems (Kwak, 2017): delays during project implementation, imperfect project design, uncoordinated implementation, delays between project identification and start-up, poor stakeholder management, poor communication structures, coordination and cost overruns failures (Kikwasi, 2019). The need to implement successful water projects calls for optimum practices. Knowing the success, or outcome or performance of a construction project has a great deal of relevance to knowing the optimum practices. Rwanda, as a developing country, is faced with a myriad of project

management challenges both technical and non-technical. Whilst projects in general have their challenges regarding implementation and consequently success, construction projects in particular are plagued by a unique set of problems and challenges.

Project managers are always looking forward to seeing public projects perform well. This involves completing the project within planned budget, on time, meeting end product specifications, meeting customer needs and requirements and meeting management objectives (Cooke-Davies, 2015). Despite the quest for project success, 26.8% of projects in NPD COTRACO Ltd have continuously experienced time overrun, budget overrun, unmet end product specifications, unmet customer needs and requirements and unmet management objectives (Sibomana, Stephen & Githae, 2020). Wanderi, Mberia and Oduor (2015) also claimed that 30% of the projects are cancelled midstream, and 50% of completed projects end up to 190% over budget and 220% get completed late due to poor handling of the initial process. The high failure rate in these projects could be attributed to poor project management practices. Project failure is still reported in spite of providing material and human resources needed, (Sibomana, Stephen & Githae, 2020). Good project management practices are essentials for project performance.

Therefore, the present research investigates the extent to which the performance of road construction projects in NPD-COTRACO Ltd based within Kigali, Rwanda is linked to the project management practices.

Objectives of the Study

General Objective

To find out the link existing between the performance of road construction projects and project management practices with reference to NPD-COTRACO Ltd within Kigali.

Specific Objectives

The study was guided by four specific objectives namely;

1. To examine the impact of Project Planning practices on performance of road construction projects in NPD-COTRACO Ltd based within Kigali - Rwanda.

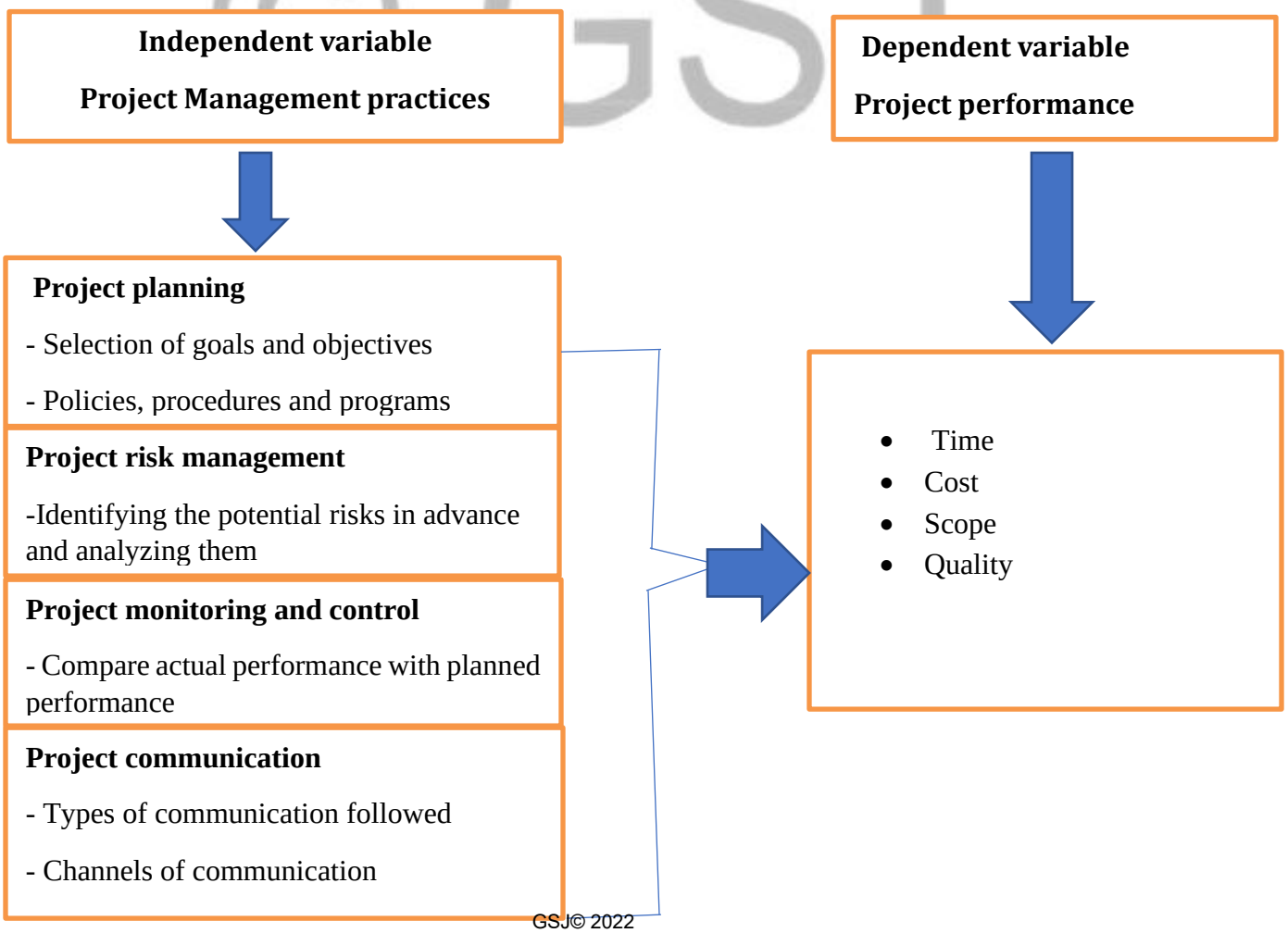
2. To examine the effect of project communication practices on performance of road construction projects in NPD-COTRACO Ltd based within Kigali Rwanda.

3. To assess the impact of project risk management practices on performance of road construction projects in NPD-COTRACO Ltd based within Kigali Rwanda.

4. To assess the impact of project monitoring and control practices on performance of road construction projects in NPD-COTRACO Ltd based within Kigali Rwanda.

LITERATURE REVIEW

CONCEPTUAL FRAMEWORK



Research Design

The suitable research design chosen was descriptive and correlational research design. A descriptive research design was used in preliminary and exploratory studies to allow researchers to gather information and summarize, present and interpret data for the purpose of clarification (Ordo, 2009). According to Mugenda and Mugenda, (2008) the purpose of descriptive research is to determine and report the way things are and it helps in establishing the current status of the population under study. Borg and Gall, (2009) note that descriptive survey research was intended to produce statistical information about aspects of a study that interest policy makers. Gay, (2007) says that surveys are self-report study that requires the collection of quantifiable information from the sample. They are useful for describing, explaining or exploring the existing status of two or more variables (Mugenda & Mugenda, 2008). Moreover, the study employed regression analysis where model summary, analysis of variance and regression coefficient were calculated.

Study Population

Target population is the specific population about which information is desired. According to Kombo and Tromp, (2009) a population is a well-defined or set of people, services, elements, events, group of things or households that are being investigated. The people interested in this research are workers working with the Kigali-based Road construction company, NPD COTRACO Ltd. Managers working with road construction companies based in Kigali were interviewed. The target respondents included 200 construction company managers, construction company assistant managers and lower-level construction company employees such as those from the headquarters of the road construction company in Kigali and community leaders. Mugenda, (2008) explains that the target population should have some obvious features, where the researcher plans to implement the findings of the research. The total population was 200 people.

Sampling

A sample is a small number of people or person selected from the target population in order to be used for collecting primary data (Gay, 2017). The author defined sampling as the process and techniques used by the researcher to obtain the small number of the respondents from the target population or study population. The author argued that sampling is applied when the study population is too large. In this study, sample size was all 200 people as they were all considered during data collection and analysis as recommended by Kabir (2016). According to him, when the target population is small, the entire population is considered during data collection.

Table 3. 1: Research Population and Sample Size

Category	Target Population	Sample size	Sampling Technique
Project managers	16	16	Purposive and census sampling
Project staff	86	86	Purposive and Census sampling
Community/opinion Leaders	98	98	Purposive and Census sampling
Total	**200**	**200**	

Data Collection Methods and Instruments

The researcher gathered raw data and second-part data. Secondary data involves data which has been gathered and recorded by other researchers for their purpose. They are also called second hand data (Babbie, 2014). Secondary data in this study was collected by reviewing past studies related to the research topic. Journal articles, unpublished thesis, internet sources, books and government reports were used to gather secondary data. On the other hand, raw data involves the first-hand information or raw data collected for the first time by the researcher (Babbie, 2014).

Primary data in this research was collected using questionnaire and interviews developed by the researcher himself.

Questionnaire

Questionnaires are very often short, pre-designed questions designed to provide specific information to address a need for research information on a specific topic. Survey data is available to respondents usually from related interest area. The questionnaire as a research tool or instrument use closed ended questions that help to extract the necessary information from the respondents. The closed ended questions are used in the research because they are easy to fill and assess whereas the open-ended questions are used because they demand the respondent's initiative and deep thinking to answer using their own words and understanding, give a deeper meaning through explanations in which they tend to be more original in giving opinions.

According to Babbie, (2014) a questionnaire is a quick and inexpensive process to obtain a vast amount of information covering a large area within a relatively short time. The choice of using questionnaire for data collection is used because; it guaranteed confidentiality; it helps to avoid fear and embarrassment, which may result from direct contact; it allows respondents to be free to answer at their own time and at their own pace.

It enables the investigator to gather large quantities of information on a considerable place and number of respondents at the same or different interval. Potential respondents including project managers, project staff and opinion leaders were given questionnaires designed to gather information related to the research objectives.

Interviews

An interview is a direct face-to-face attempt to obtain reliable and valid measures in the form of verbal responses from one or more respondents. It is a conversation in which the roles of the

interviewer and the respondent change continually (Kabir, 2016). Due to the fact that using interview helps the interviewer to clarify questions and allows the informants to respond in any manner they see fit and it helps the interviewer to observe verbal and non-verbal behavior of the respondents the researcher find it crucial to be used. In this study interview was conducted with project managers.

Reliability and validity

Ochieng (2019) argues that, for a study to be real meaning, it has to apply valid and reliable instruments. Before actual research to be done, pretest was done and validity and its reliability were established.

Validity

Validity means ascertaining the accuracy of the instruments by establishing whether the instruments focus on the information they are intended to collect. In order to ascertain face validity, the instruments were constructed and handed to the supervisor for constructive criticisms. Thereafter, they were revised according to the supervisor comments. In addition, content validity was also sought by requesting four experts in field of study to provide their comments on the relevance of each item on the instrument.

The experts were requested to indicate whether the item was relevant or not. The results of their indications were analyzed to establish the percentage representation using content validity index.

Content Valid Index (CVI) is a scale developed by computing or ranking the relevant items in the instrument or questionnaire by checking their clarity, their meaningfulness in line with all objectives stated, dividing by the total number of items.

Content Validity is the degree to which an instrument has an appropriate sample of items for the construct being measured and is an important procedure in scale development. CVI is the most widely used index in the quantitative evaluation. CVI ›0, 6 was computerized for validation. Thereafter, based on the feedback, the researcher eliminated items that were unclear, irrelevant or redundant and calculated the content validity using the Content Validity Index formulae (CVI) by Amin (2018). The CVI of above 0.6 is an appropriate validity.

From the above result, the validity of the study's result indicated a validity of 0.82, which was the average of 82% that allowed the researcher to regard the instrument valid as emphasized by Amin (2018)

Reliability

Reliability refers to the consistency of the instruments in tapping information from more than one respondent. To achieve the reliability of the instruments in this study, a pilot study was conducted on 15; the researcher established the reliability of the instruments. Reliability was carried out on case studies that were outside the study. The Cronbach's Alpha Coefficient was computerized by use of SPSS (Statistical Package for Social Sciences) Software to determine how items correlated to one another; A Cronbach Alpha (0.7) was proved valid (Amin, 2018).

Reliability was at 0.902 Cronbach's Alpha, results obtained using SPSS computer software. According to Amin (2018), the Coefficient must be 0.7 and above to certify that the instrument is reliabl Reliability testing

Cronbach's Alpha*	Number of Items
0.902	43

Source: primary data, 2022

Findings

Presentation of Findings on Independent Variables

This section presents respondents' perceptions of the independent variables used in this study to assess project management practices such as project planning, project risk management, project monitoring and control and communication.

Perception of respondent on project planning

This part illustrates the perception of the respondents on project planning practices and its effect on the success of construction project. The views of respondents on the used statements to measure project planning practices are shown below.

Project planning practices

Items related to project planning	**Mean**	**Evaluation**	**Std. Deviation**	**Level spreading**
The performance of construction projects are affected by project goals and objectives	3.99	Strong/high	.723	Homogeneity

Human resource involved in the process of planning lead to implementation of project performance.	3.87	Strong/high	1.03	Heterogeneity
The budget for all project activities improves project Performance.	3.97	Strong/high	.878	Homogeneity
Materials used for project activities are timely provided and enhance performance of projects	4.15	Strong/high	.736	Homogeneity
Policies, procedures and programs contribute to performance of projects	4.07	Strong/high	.702	Homogeneity
Average	4.0		.38	

Source: *Field data, 2022*

This table shows the perception of respondents on different items used to estimate project management practices and its effect on performance of construction project. Findings in the table indicated that a greater number of respondents were in accordance that the performance of construction projects was affected by project goals and objectives on the strong mean of 3.99 and the respondent had similar perception on this statement because of 0.723 of the standard deviation. Results in the table also show that majority of respondents stated human resource involved in the process of planning lead to implementation of project performance as indicated by strong mean of 3.87 and respondent had different viewpoints because of 1.03 of the standard deviation.

In determining whether the budget for all project activities improve project performance, findings in the table revealed that a greater number of respondents were in accordance with this statement as shown by strong mean 3.97 and similar perception by respondent because of 0.878 of the standard deviation. Findings on the item ‘‘materials used for project activities are timely provided and enhance performance of projects’’ indicated that larger number of respondents were in

consonance with this statement due to the strong mean of 4.15 and similar perception among respondents because of the 0.736 of the standard deviation.

The last item which states that policies, procedures and programs contribute to performance of projects, findings in the table indicated that most of the respondents were in agreement with this statement as shown by strong mean of 4.07 and similar perception among respondents because of the 0.702 of the standard deviation. The overall mean of 4.0 in the table indicated that most of respondents were in agreement with all the statements employed to evaluate the project planning practices. This strong mean of 4.0 implies that all project planning variables influence project performance. Results from interviews also indicated that aspect such as material planning practices, financial planning practices and human resources planning practices impact on the success of road, construction project. Therefore, project managers should bear in mind the project planning variables to secure project performance.

Table showing Correlation between project management practices variables and project performance

Project management practices		**Project Performance**
Project planning	Pearson Correlation	.816**
	Sig. (2-tailed)	.000
	N	200

Overall correlation between project management practices and project performance

		Project Performance
Project Management Practices	Pearson Correlation	.875**
	Sig. (2-tailed)	.000
	N	200

**. Correlation is significant at the 0.05level (2tailed).

Table 4. 1: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.401	2.486		4.184	.000
	Project planning practices	.650	.137	.260	4.746	.000
	Project communication practices	.364	.110	.194	3.320	.001
	Project risk management practices	.474	.232	.155	2.044	.042
	Project monitoring and control practices	.832	.167	.341	4.983	.000

a. Dependent Variable: Project performance

Conclusions and Recommendations

The study aimed at examining the link existing between the performances of road construction project in NPD-COTRACO ltd based in Kigali and project management practices. The primary information was collected from 200 respondents using questionnaire as main instrument of data collection. Quantitative data were inspected employing SPSS version 25.0 and tables have been used to illustrate the outcomes of the research. Descriptive statistics such as frequency, percentage, mean and, standard deviation were used to discuss the findings while Pearson correlation was employed to examine the connection between project management practices and project performance.

The findings on the first objective indicated that most of the respondents revealed that project planning practices have great impact on performance of road construction as shown by strong mean of 4.0. The results on the first objective also indicated that the performance of road construction project in NPD-COTRACO ltd based in Kigali was positively linked to project planning practices on correlation coefficient of 0.816^{**} and tailed p-value of 0.000 which is less

than 0.05 shows that the found relationship is statistically significant. These findings concur with that of Ndavi (2015) who found that material usage planning practices, financial planning practices and human resources planning practices have significant/strong effect on the success of construction project in Nairobi city.

From the statistics in the table, it is shown that there is a positive relationship between project management practices and project performance on correlation coefficient of 0.875^{**} and tailed p-value of 0.000 which is less than 0.05 shows that the found relationship is also statistically significant.

The results from the Regression Coefficients showed that project planning practices has positive and significant effect on performance of road construction project (β_1= 0.260, t= 4.746, sig. = 0.000). This indicates that 1% change in project planning practices leads to 26.0% on improvement in performance of road construction project.

Recommendations

Firstly, the outcomes of the research showed that project planning practices have influence on performance of construction project. It was therefore recommended that project planning practices such as setting of goals and objectives, involving human resource in the process of planning and availing materials timely should be emphasized to boost the success of road construction projects. Secondly, there should be involvement of team members of the project in identification, analysis and management of risks for better success of road construction projects.

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