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Influence of Resource Planning on Project Performance in Rwanda: A Case Study of Construction of New Maternity Project at King Faisal Hospital in Kigali

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Abstract

The general objective of this study was to assess the effect of Resource Planning on Performance of new maternity project at King Faisal Hospital. Specific objectives were to find out the influence of human resource planning on performance of new maternity project at King Faisal Hospital, assess the influence of the material resource planning on performance of new maternity project at King Faisal Hospital, examine the influence of financial resource planning on performance of new maternity project at King Faisal Hospital and find out the influence of time planning on performance of new maternity project at King Faisal Hospital. For this study the population where 360 participants may include project staff, consultants and sub-contractors. The sample size was 184 people have project successes in on performance of new maternity project at King Faisal Hospital. The choice of data collection tools depends on the research objectives, the type of data needed, and the preferences of the researcher. Documentation, Questionnaires, Interviews, and Observations were used as tools of data collection. Understanding the correlation between resource planning and project performance were not only benefit project managers in enhancing their decision-making process but also contribute to the broader field of project management by providing evidence-based best practices. Statistical Package for the Social Sciences for quantitative data analysis, including descriptive statistics, correlation analysis, regression analysis, and inferential statistics. The findings indicate a one-unit increase in Human Resource Planning corresponds to a 0.538 unit increase in Project Performance ($\beta=0.538$ $t=6.896$ p value = 0.000). Similarly, a one-unit increase in Material Resource Planning corresponds to a 0.243 unit increase in Project Performance ($\beta=0.243$ $t=2.792$ p value = 0.006). A one-unit increase in Financial Resource Planning leads to a 0.237 unit increase in Project Performance ($\beta=.0237$ $t=3.645$ p value = 0.000), and a one-unit increase in Time Planning corresponds to a 0.201 unit increase in Project Performance ($\beta=0.201$ $t=2.092$ p value = 0.037). All predictors have extremely low significance values (all less than 0.05). The King Faisal Hospital should prioritize effective human resource planning through skill assessment and teamwork, nurture vendor relationships for efficient material planning, establish clear budget allocation mechanisms for financial planning, and implement complex project management tools to enhance time planning and new maternity project performance.

Key words: *Resource Planning, human resource planning, material resource planning, financial resource planning, time planning, project performance*

1. Introduction

In Rwanda, government projects encounter a range of challenges during their implementation, including issues related to contract management, weaknesses in procurement systems, and notably, inadequate planning. This subpar planning significantly impacts national projects, especially those in construction (OAG, 2014). Furthermore, the failure of the "One Laptop per Child" project, as reported by ADRA in 2016, is attributed to poor planning, underlining the critical role that effective project planning plays in achieving project objectives, with just 45% of projects having a central role in promoting sustainability.

Generally speaking, there are few studies conducted on project planning practices and project performance in the region, including Gahigana's (2019), which assessed the determinants of project success. Dufitumukiza (2022) conducted research about the project planning and sustainability of the Rwanda education assistance project in Rwamagana district; Eric (2021) analysed the effect of project planning practices on improving project performance in Rwanda.

As earlier mention, the studies did not focus on the effect of resource Planning on Project Performance in new maternity project at King Faisal Hospital. Hence, the need for this study to be carried out to specifically address the academic parity gap in understanding the critical role of human resource planning, material resource planning, financial resource planning and time plan on new maternity project at King Faisal Hospital.

The general objective of this study is to assess the effect of Resource Planning on performance of new maternity project at King Faisal Hospital.

Specifically, the study had the following objectives:

- i. To find out the influence of human resource planning on performance of new maternity project at King Faisal Hospital.
- ii. To assess the influence of the material resource planning on performance of new maternity project at King Faisal Hospital.
- iii. To examine the influence of financial resource planning on performance of new maternity project at King Faisal Hospital.
- iv. To find out the influence of time planning on performance of new maternity project at King Faisal Hospital.

Based on the research questions and the literature review, the following hypotheses are proposed for this study:

H₀1: There is no significant influence of human resource planning on performance of new maternity project at King Faisal Hospital.

H₀2: There is no significant influence of material resource planning on project performance on performance of new maternity project at King Faisal Hospital.

H₀3: There is no significant influence of financial resource planning on project performance on performance of new maternity project at King Faisal Hospital.

H₀4: There is no significant influence of time planning on project performance on performance of new maternity project at King Faisal Hospital.

2. Literature review

The main theory underlying this study is theory of change. Details on theory are reviewed in the following section.

Theory of change

The concept of a Theory of Change (ToC) is not attributed to a single inventor or specific point in time. It has evolved over decades within the fields of program evaluation, social change, and development. This was made by the Aspen Institute Roundtable on Community Change in the 1990s as a way to model and measure the activities of exhaustive networks. The Theory of Change is a full picture and explanation of how and why a change that is wanted is expected to happen. This is why ToC must be considered in project management practices because when you plan, you set changes that you want to realize or you determine what you want to achieve, how it will be achieved, and when it will be realized. The performance of the project is measured according to the indicators of changes that you have planned for (James, 2011).

Even when there is a firm grasp on the problem and know exactly what you want to achieve, project management can feel insurmountable. You can use a Theory of Change to map out your course of action as you go from the current state to your desired future state of affairs. The Theory of Change (ToC) provides an explanation for why and how a given change process will occur. The rationale lays forth the assumptions that underpin the proposed intervention and demonstrates the causal relationships between the short-, intermediate-, and long-term outcomes (Vogel, 2012).

A theory of change should think about the most important changes a project wishes to make, the different routes it could take to achieve those changes, and the reasoning behind choosing one path over another. The theory of change gives us a way to think about how to make the change we want in a world that is constantly changing and uncertain. As a result, we are better able to organize and prioritize our efforts in light of the realities of the world we live in and the means at our disposal (Danielle and Craig, 2012).

So, the theory of change is closely related to project management and project performance. This is because when you plan to manage, there is need to take strategies that will help to reach on objectives as well as the goal, and once the goal is reached, there is the reality of the dream or change or impact made by the proper execution of the plan (Patricia, 2014).

The researcher used the theory of change to find out how project planning practices affect project performance. The researcher did this by looking at how well the project was set up to make the changes that were wanted and whether or not those changes were made. Researchers can also tell if the changes they wanted to see happened by measuring how well the project did. This is because the theory of change in project management practices can be seen as inputs whose results can be seen in how well the project did.

Stakeholder theory

Stakeholder theory was first proposed by R. Edward Freeman, a professor of business administration at the University of Virginia, in his book *Strategic Management: A Stakeholder Approach* published in 1984. Freeman argued that businesses should not only focus on maximizing shareholder value, but also consider the interests and needs of other stakeholders. The idea of stakeholder theory was further developed by other scholars and practitioners, such as Thomas Donaldson, who emphasized the ethical and moral dimensions of stakeholder

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theory, and Archie Carroll, who proposed a framework of corporate social responsibility that incorporated stakeholder theory (Freeman *et al.*, 2020).

Stakeholder theory is a management theory that indicates that an organization should consider the interests and needs of all of its stakeholders, rather than just its shareholders or owners. The stakeholders of an organization may include employees, customers, suppliers, communities, and even the environment. According to the stakeholder theory, an organization should take into account the interests of all its stakeholders when making decisions and planning strategies. This means that an organization should not only focus on maximizing profits for its shareholders, but also on creating value for all its stakeholders. By doing so, an organization can create long-term value for itself and for its stakeholders (Phillips & Freeman, 2021).

According to Jones (2021) the stakeholder theory also emphasizes the importance of stakeholder engagement and communication. By engaging with its stakeholders and understanding their needs and concerns, an organization can better address their interests and build stronger relationships with them. This can lead to greater trust, loyalty, and support from stakeholders. Stakeholder theory has become increasingly important in modern business practice, as organizations recognize the importance of social responsibility, sustainability, and ethical behaviour. By taking a stakeholder approach, organizations can not only achieve financial success, but also create social and environmental value for the communities they serve.

Through the stakeholder theory, the study recognized that resource planning decisions can significantly affect the hospital's various stakeholders, including patients, staff, suppliers, and the broader community. By examining these planning components in the context of the maternity project, the study sought to understand how effective resource planning can lead to improved project performance, ensuring that the hospital meets the expectations and needs of its diverse stakeholders while enhancing overall healthcare service delivery.

Goal setting theory

Goal setting theory was first proposed by Edwin Locke, a psychologist, and Gary Latham, a management researcher, in the late 1960s and early 1970s. They argued that setting specific and challenging goals can lead to improved performance and motivation for individuals and teams. Locke and Latham proposed that goals should be specific, measurable, attainable, relevant, and time-bound (SMART). They also indicated that feedback and support from managers and colleagues can help individuals achieve their goals and improve their performance (Latham & Locke, 2019).

Goal setting theory is a management theory that proposes that setting specific and challenging goals can lead to increased motivation, performance, and achievement. According to the theory, individuals and teams perform better when they have clear goals to work towards and a sense of purpose and direction. Critics of goal setting theory argue that it can lead to unintended consequences, such as unethical behaviour or a focus on short-term goals at the expense of long-term goals. However, advocates of the theory argue that these risks can be mitigated by careful goal setting and management. Goal setting theory has had a significant impact on management practice and continues to be an important area of research and development in the field of organizational behaviour (Seijts & Latham, 2020).

In this study, resource planning serves as a critical aspect of goal-setting, as it involves the allocation of human, material, financial, and temporal resources, all of which play a pivotal role in achieving project goals and objectives.

3. Research methodology

This chapter describes the general approach of the study, it describes the research tools employed and the methods used in the process of data collection.

Research Design

The research aims to investigate the influence of resource planning on project performance, specifically examining the relationship between resource planning strategies and various project success metrics. The researcher conducted both descriptive and correlational studies, also quantitative and qualitative approach applied in this study to provide a more comprehensive and well-rounded understanding of the research topic.

Study Population and sampling

The study population should be defined based on the research objectives and the specific research questions being addressed. It should be clearly delineated to ensure that the findings from the study are representative and applicable to the intended population. For this study the population was 360 participants included project staff, consultants and sub-contractors.

Sample determined using slovin's formula $n = N / (1 + Ne^2)$ Where: n = sample size, N = Total population and e = margin of error. The researcher used the following data: $N=360$ adults; confidence level=95% thus $e = 1 - 0.95 = 0.05$

$$n = \frac{360}{1 + 360(0.05)^2} = \frac{360}{1.9} = 184$$

The sample size was 184 participants. Sample size on each category was calculated by taking population of the category divided by total population of the study times sample. The stratification of a community into different segments, or strata, is the basis of the sampling technique called as stratified randomization. When conducting a stratified random sample, groups are divided into strata according to their shared themes. Each stratum has its own random sample selected from it, in a size that is proportionate to its result of the increasing number.

Research Instruments

Participants sent a survey with short, Agree/Disagree answers for this research. With response options (closed questions), the responders presented with a number of options from which to choose an answer. To that end, the survey makes no assumptions about the complainant's level of education or experience beyond their ability to read and write. For this experiment, participants given the questionnaires and expected to fill it out independently, before returning it to the investigator through the same method and in the specified time frame.

The practice of gathering information via reading relevant papers is known as the documentation method. This approach facilitated the study team's perusal of the relevant material for the purpose of expanding and deepening their comprehension of the topics at hand. Using this method, you may not only learn more about the topic at hand, but also get observation from a variety of sources.

Reliability

In this study, the researcher used Cronbach alpha technique as a measure of dependability. Cronbach’s alpha, α (or coefficient alpha)’s values range from 0 to 1, and higher values imply more dependability. In speaking, a rating of higher than or equivalent to 0.7 is appropriate.

Table 1: Reliability

Variables	Cronbach alpha	Decision
Human resource planning.	.822	Reliable
Material resource planning	.798	Reliable
Financial resource planning.	.803	Reliable
Time planning	.831	Reliable
Project performance	.827	Reliable

Data Analysis

Data analysis was a crucial step in the research process that involves examining and interpreting collected data to derive meaningful observations, identify patterns, test hypotheses, and answer research questions. The specific data analysis techniques used depend on the nature of the data and the research objectives. Here are some commonly used data analysis methods. As a result, analysis might be classified as descriptive or inferential (Inferential analysis is often known as statistical analysis). in this research, first, descriptive statistics was used to check the mean and the standard deviation. Second, inferential statistics was used to determine the correlation and regression between the study variables.

Ethical Considerations

Ensuring the rights, privacy, and well-being of the participants was essential throughout the research process. The need not to harm or humiliate individuals and to respect their confidentiality coexisted with the pursuit of information. When doing investigation, researcher first considered whether or not their own personal principles and methods make the endeavour morally acceptable. To ensure ethical conduct during the study, the researcher put mechanisms in place to ensure adherence. The researcher explained the purpose of the study, the degree to which their participation is optional, and the confidentiality of their findings.

4. Research findings

This section primarily encompasses the research outcomes and a comprehensive discussion of the findings. The survey comprised a sample size of 184 participants, with all distributed questionnaires being successfully completed and returned by the respondents. Correlation analysis examined the relationship between variables to determine if they are related and the strength and direction of that relationship. Regression analysis helped to predict the value of the dependent variable based on the independent variables.

Table 2: Correlation matrix

		Human Resource Planning	Material Resource Planning	Financial Resource Planning	Time Planning	Project Performance
Human Resource Planning	Pearson Correlation	1	.628**	.636**	.737**	.702**
	Sig. (2-tailed)		.000	.000	.000	.000
	N		184	184	184	184
Material Resource Planning	Pearson Correlation		1	.499**	.757**	.541**
	Sig. (2-tailed)			.000	.000	.000
	N			184	184	184
Financial Resource Planning	Pearson Correlation			1	.613**	.587**
	Sig. (2-tailed)				.000	.000
	N				184	184
Time Planning	Pearson Correlation				1	.528**
	Sig. (2-tailed)					.000
	N				184	184
Project Performance	Pearson Correlation					1
	Sig. (2-tailed)					
	N					184

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

Source: Primary data, September 2023

Table 2 presents correlation coefficients specifically between the predictors (Human Resource Planning, Material Resource Planning, Financial Resource Planning, and Time Planning) and the outcome variable (Project Performance).

Human Resource Planning shows a strong positive correlation with Project Performance ($r=0.702$, $p < 0.05$), indicating that effective planning of human resources is closely associated with achieving better project outcomes. Also, Material Resource Planning is strongly positively correlated with Project Performance ($r=0.541$, $p < 0.05$), emphasizing that meticulous planning of material resources contributes to improved project performance. Moreover, Financial Resource Planning demonstrates a robust positive correlation with Project Performance ($r = 0.587$, $p < 0.05$), underscoring the importance of effective financial resource allocation in influencing project success. Furthermore, Time Planning displays a strong positive correlation with Project Performance ($r=0.528$, $p < 0.05$), highlighting that efficient time management plays a significant role in determining successful project outcomes. The findings indicate the critical need for a holistic approach to resource planning in ensuring the positive effect of the new maternity project at King Faisal Hospital.

The findings align with the studies by Adedayo (2018) and Eric (2021) consistently emphasized the crucial role of strategic project planning in determining project success. Adedayo's research emphasizes the value of effective project scope management, where factors like customer expectations, satisfaction, resource allocation, and project duration significantly affect project performance. This aligns with Eric's findings, showing a strong positive correlation between adept project scope planning, effective financial management, resource allocation, and successful outcomes. These studies collectively emphasize comprehensive planning's crucial role in the performance of the new maternity project at King Faisal Hospital.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739 ^a	.547	.537	.4424

a. Predictors: (Constant), Time Planning, Financial Resource Planning, Material Resource Planning, Human Resource Planning

Source: Primary data, September 2023

The Table 3 indicates high R value of 0.739 indicates a strong relationship between the predictors (Time Planning, Human Resource Planning, Material Resource Planning, and Financial Resource Planning) and Project Performance. This indicates that the combination of these planning aspects collectively plays a significant role in determining the overall success of the new maternity project at King Faisal Hospital. Furthermore, the significant R Square value of 0.547 indicate that a significant portion of the variability in Project Performance can be explained by the joint effects of these predictors. This reinforces the notion that effective resource planning across different dimensions (time, human, material, and financial) is crucial for achieving a high level of project performance. The findings align with Carvalho and Rabechini (2017)' highlight growing pressure on donors to reevaluate aid programs. Their views reinforce the importance of effective planning to prevent suboptimal outcomes and project failures. This context indicates the significance of comprehensive project planning, correlating with findings on the new maternity project's success at King Faisal Hospital.

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.259	4	10.565	53.902	.000 ^b
	Residual	35.027	179	.196		
	Total	77.286	183			

a. Dependent Variable: Project Performance

b. Predictors: (Constant), Time Planning, Financial Resource Planning, Material Resource Planning, Human Resource Planning

Source: Primary data, September 2023

In Table 4, the ANOVA (Analysis of Variance) results provide information about the overall fit of the regression model that includes the predictors: Time Planning, Human Resource Planning, Material Resource Planning, and Financial Resource Planning. The high F value of 53.902 indicates that the regression model, which incorporates Time Planning, Human Resource Planning, Material Resource Planning, and Financial Resource Planning as predictors, significantly contributes to explaining the variability observed in Project Performance. The extremely low p-value ($p < 0.05$) further reinforces this finding, indicating that the model's explanatory power is not due to chance but rather to the meaningful influence of the predictors.

According to Larsson and Larsson (2020) a well-wrought strategic planning (Time Planning, Human Resource Planning, Material Resource Planning, Financial Resource Planning) helps you to set priorities, acquire and allocate the resources needed to achieve your goals. It provides a framework for analysing and quickly adapting to future challenges and though the performance of the project.

Table 5: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
	(Constant)	.827	.203		4.074	.000
1	Human Resource Planning	.538	.078	.549	6.896	.000
	Material Resource Planning	.243	.087	.219	2.792	.006
	Financial Resource Planning	.237	.065	.248	3.645	.000
	Time Planning	.201	.096	.194	2.092	.037

a. Dependent Variable: Project Performance

Source: Primary data, September 2023

In Table 5, the Coefficients section provides information about the regression coefficients for each predictor variable, along with their statistical significance. The constant value is 0.827. This represents the expected value of the dependent variable (Project Performance) when all predictor variables (Human Resource Planning, Material Resource Planning, Financial Resource Planning, and Time Planning) are equal to zero. The unstandardized coefficients represent the change in the dependent variable (Project Performance) for a one-unit change in the predictor variables, holding other predictors constant. For instance, a one-unit increase in Human Resource Planning corresponds to a 0.538 unit increase in Project Performance ($\beta=0.538$ $t=6.896$ p value = 0.000). Similarly, a one-unit increase in Material Resource Planning corresponds to a 0.243 unit increase in Project Performance ($\beta=0.243$ $t=2.792$ p value = 0.006). A one-unit increase in Financial Resource Planning leads to a 0.237 unit increase in Project Performance ($\beta=.0237$ $t=3.645$ p value = 0.000), and a one-unit increase in Time Planning corresponds to a 0.201 unit increase in Project Performance ($\beta=0.201$ $t=2.092$ p value = 0.037). All predictors have extremely low significance values (all less than 0.05). This indicates that each of these predictors significantly contributes to predicting Project Performance. Semigabo (2015) study and this research both highlight key elements for project success. Diligent workers, management support, and strong planning, emphasized by Semigabo, align with our predictors like Human Resource, Financial Resource, Material Resource Planning, and Time Planning. Similarly, staff competence, ownership, and clear criteria correlate with these predictors, underlining their role in anticipating and achieving favourable project outcomes.

5. Conclusion

The main objective of this study was to assess the effect of Resource Planning on the performance of the new maternity project at King Faisal Hospital. Through specific objectives, the study aimed to determine the influence of human resource planning, material resource planning, financial resource planning, and time planning on project performance. These outcomes highlight the crucial role of comprehensive resource planning, spanning various dimensions, in attaining favourable project outcomes. As a result, the null hypotheses (H01,

H02, H03, and H04) which suggest no significant influences of human resource planning, material resource planning, financial resource planning, and time planning on project performance, are anticipated to be rejected. This indicates that there is collective evidence indicating the strong effect of these planning elements on the success of the new maternity project at King Faisal Hospital.

6. Recommendations

It is recommended that King Faisal Hospital places a significant emphasis on effective human resource planning. This can be achieved through regular skills assessment and training programs for the project team members.

King Faisal Hospital should establish strong vendor relationships to ensure timely availability of required materials. Implementation of efficient inventory management practices and embracing technology for real-time tracking can help prevent delays due to material shortages.

King Faisal Hospital should implement strong project management tools and methodologies. This includes creating detailed project schedules with well-defined milestones and regular progress monitoring.

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