International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

Influence of Project Design Documentation on the Performance of Government Projects in Rwanda

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Abstract: ***Use of documentation design framework approach in most organizations has been known to provide tools for the success of many projects. The purpose of the study was therefore to assess the influence of documentation framework on the performance of government projects in Rwanda. A survey using a closed ended questionnaire was conducted on 110 managers obtained through stratified sampling from a total of 150 top managers of nine selected ministries in Rwanda. Data collected was analysed through SPSS version 21, for both descriptive and inferential statistics. Regression analysis was used to establish the relationship between the dependent and the independent variables. From the research findings a majority of the respondents strongly agreed that; the project had clear documentation specifications with a mean score of 4.48,the design of organized project documentation by a mean of 4.25 while, project design involved a team of multiple stakeholders represented by a mean of 4.20, problems and needs were identified and 36 solutions strategized as shown by a mean of 4.17 and impartial reviews were conducted to ensure specifications are met as shown by a mean of 4.06. The study concludes that the regulatory and legal conditions should be clear to the project team and a clear plan outlining timeframe for acquiring the products should be in place since it also affects performance of government projects in the District. The study recommends that specifications given in project design should be followed to ensure that projects meet the standards set by the stakeholders.***

Keywords: Project design framework documents, Performance, Government projects and Gasabo District

1. Background

It has been acknowledged globally that, proper documentation acts as evidence that a project was properly initiated and completed within the stipulated time, scope and cost Kastner (2010). Some key documents that scholars have used as evidence for an effective initiation of projects include; the communication plan, procurement plan, risk management plans and the project design plan (Ramabodu, & Verster, 2010).

Application of project management documents in Africa shows positive effective on project outcomes in the continent, especially in the private sector and in Non-Governmental Organizations (NGOs). Research into Nokia projects in Africa (Sheiki, 2014) revealed a positive correlation between proper Earned Value Management (EVM) and project success. The study established that planning phase and initial assumptions made influence the way EVM can be handled, hence impacting on project outcome. Amponsah (2012) conducted a study to identify the general reasons why projects fail in Ghana with focus on Accra and Kumasi. The study found that over 59% of the project managers had no knowledge of project management and did not even have designs of their projects. The study concluded that poor project design was a factor leading to project failure.

According to Mochal (2009) even with sound project teams and plans in place, organization's project success rate in Kenya are not as high as it could be. Meredith and Mantel (2011) suggests that the use of project design documents successful projects in Uganda have 80-85% of all the project activities and resources utilization.

In Rwanda, the goal of having a constructed facility completed in a given time, within specified cost and quality requires planning (RDB, 2014).

Although still behind comparators in the region on key economic and social indicators, Rwanda has made remarkable progress since the 1994 genocide against Tutsi (Minecofin, 2014). And one of the greatest gains for Rwandans has come from the strong growth in construction that saw 8 percent share in total employment 2016 as a result of increased public spending on key infrastructural projects including rehabilitation of public buildings, hospitals, schools, airport, hotels, road networks and maintenance.

Project Managers of the constructions and engineering firms (ROKO,NPD COTRACO,HORIZON, etc…) implementing these infrastructure projects revealed that construction projects that pursued project design plans, alongside well documented project guidelines, periodic audits and progress information, corrective actions, and pre-work assessments conducted saw a decrease of 35% exposure risk in regards to clients dissatisfaction for things like low quality of building at completion, constructions project increased cost, project complexity amplified, or the inability to control project period.

On the other hand, they underlined some challenges during execution of constructions projects. One of them being land tenure and ownership documentation. For example, in 2013 a proposed school construction was planned to be built on a strategic land in Ngororero District, on the assumption that it belonged to the district, yet the land was owned by a citizen leaving abroad and had all ownership documents. When all construction materials, project team, contractors, and workers were on the project site, they were told to hold for the district to work on changing land ownership. They had to

wait for 2 months to do land expropriation and change ownership in favour of the district, and have the project kick start, and have the land owner compensated. Would the district worked on project design documentation, this issue would have been avoided at early stage and prevent wastage of project resources for 2 months.

Another example is a case of the construction project design proposed for offices in the early stages of "constructing a 4 floors building" then at the request of the designated ministry, changed the design adding a larger parking lots, and 2 more floors to make it 6 floors. The changes required revision of the plans and engineering designs – changes that did not involve and communicated timely to the stakeholders and appropriately documented.

The project plans and control documentations were insufficient and not timely shared with concerned according to RDB 2014. The client (the Ministry representative) and RHA team task to monitor the quality and timelines of a contract's key outputs was not effectively carried out. Project design plan documents dictates that, "delays in completing outputs or problems in output quality is an early warning that results may not be achieved as planned," and that "early action in response to the problems must be undertaken.

These issues put the activities significantly behind schedule and the constructing firms in a poor position to achieve goals within budget and on schedule.

As per Ramabodu and Verster, (2010) project communication plans is today not used as an asset in design work, it is used for planning a resource. It might seem like communication occurs once information is produced and delivered, it is not. There is a big difference between information and communication. Information is one out of many different work tasks while the second one is a way of working. The communication is evaluated to be one of the significant factors when determining the success of the construction. The communication in advance is key to everything. The communication after the matter is only an explanation of the state of the situation.

There are strategic, tactical and operational plans and the type of planning required differs according to the management level in the organisation. Strategic plans are detailed action plans mapped out to reach strategic goals. Strategic plans address such issues as how to allocate resources, and actions to be taken to create a unified organisation. Tactical plans are the means charted to support implementation of the strategic plan and achievement of tactical goals (MINECOFIN, 2014). Tactical plans are more specific and concrete than strategic plans and consider intermediate time frame. In developing tactical plans, a number of possibilities may be considered before setting a particular plan. The plan is of course subject to change should things not progress as expected. Operational plans are means devised to support implementation of tactical plans and achievement of operational goals. Operational plans consider relatively short time frame, such as requirements for a few weeks or days (Kathryn & David. 2011).

Construction risks can be related to technical, management, logistical, or socio-political aspects or can be related to project design formulation. In the domain of project management, some of the critical effects of risks are failure to achieve operational requirements and the required quality, non-completion of the project within stipulated time and estimated cost thrived by project plans documentation (Kerzner, 2011)..

1.2 Statement of the Problem

In Rwanda 30% of all projects are cancelled midstream, and over 50% of completed projects end in up to 190% over budget and 220% late because of the poor handling of the initial process of design documentation, there is a link between the project documents and the performance of the project. (Wanderi, Mberia & Oduor, 2015).

According to Wanderi, Mberia and Oduor (2015) The issue of project design has become of great importance especially with the ever-growing concerns and demands from various players in the market. These demands arise due to the increased number of reported quality issues like the frequent collapse of structures leading to injuries and deaths. To respond to these failures, most organizations have resorted to adopt and implement operations management strategies that have been seen to work elsewhere in as much as quality management is concerned. However, this has not been successful (Walliman, 2011).

Alarmed by the challenges affecting the construction industry, the Rwanda Housing Authority recommended that construction companies adopt documents that are already planned (RHA 2013). In reference to Rwanda no conclusive studies have been carried regarding project documentation process thus creating an opportunity for this research to fill the information gap.

2. Literature Review

Stakeholder document, plays a critical role in project performance as a key success factor (Beringer et al., 2012). The Stakeholder management does not just focus on single stakeholders, but accounts for all stakeholders' influence on one another in complex interactions of multiple, and potentially interdependent stakeholders (Beringer et al., 2012).

Over the years another central objective of documentation has emerged: gathering the accumulated experience to "feedback" into the design and preparation of future projects and into the improvement of policies and procedures.

In addition, projects have different phases, such as the conceptual, planning, execution and termination phases. These project phases have dramatically different characteristics (Turner, 2009) and create a dynamic context for managing stakeholders and their behavior as the project shifts through the different phases of its lifecycle (Aaltonen and Kujala, 2010). Thus, a better understanding of Stakeholders management trends during project lifecycle might increase project performance when facing the complexity of projects.

Project documentation covers documents created during and for the project itself. Examples include the overall project vision, the project plans, the schedule, and the risk analysis. The documentation process has a deeper purpose than merely creating piles of paper.

The purpose of the project initiation document is to provide the information required by senior management and stakeholders to enable them to commit to the resources and timelines proposed. It is a sort of 'contract' between the Project Manager and Project Board that defines how the project will be run. The project initiation document provides a detailed proposition against which success can be measured. To do this the project initiation document builds on the approved project brief by defining in detail how the project will be developed and when it will be delivered. It provides a more detailed understanding of the costs and benefits of the project and, in particular, the resources, risks and timelines required for successful delivery.

Good project management aims to manage the exposure of the project to risk by driving action to improve control of uncertainty and take steps to reduce the chance of failing to achieve the stated objectives. A successful project manager will routinely review their exposure to risk and the steps being taken to manage it. The Project Board, should be actively engaged in the risk management process to ensure that risks are identified by members of the project team and that emerging risks are escalated upwards as required.

2.1 Theoretical framework (Knowledge based theory)

The Knowledge Based View (KBV) perspective (Cameron, 2010) examines how to effectively and efficiently conduct knowledge management. This approach considers firms as bodies that generate, integrate and distribute knowledge. According to the knowledge-based view, competitive success is governed by the ability of organizations to develop new knowledge-based assets that create core competencies (Kahn, 2011). KBV argues that knowledge is a firms most important and primary resource (Molnar & Rogers, 2016). The KBV holds that the two predominant goals of the firm are the generation and application of knowledge.

In the knowledge-based view, knowledge is conceptualized as a resource that can be acquired, transferred or integrated to achieve sustained competitive advantage. Thus, emphasizing the strategic importance of knowledge as a source of competitive advantage. Atkinson et.al, (2014) posit that what firms do better than markets is the creation and transfer of knowledge within the organization. Kraaijenbrink et al (2010) provides a framework for understanding the structure for integrating individual and organizational knowledge. The authors agree that organizational knowledge should be understood as the process that amplifies knowledge created by individuals and crystallized as part of the firm's knowledge.

The project design documentation plan execution process ensures effective and efficient carrying out of planned activities of a project. The execution has to be done according to measurements against project plans, specifications and the original project feasibility concept. Without a defined project execution process each team in the project would execute projects using their own best practices, experience, and methods making it harder to control, track and take corrective action KBV considers the firm as a resource (knowledge) that can be organized to attain competitive advantage (Killen et al., 2012). However, this theory ignores other variables that may affect the performance of firms. The current study looked at knowledge management as influencing the performance of construction firms in Rwanda. It emphasized that firms can utilize knowledge management strategies as a lee way to gaining competitive advantage and hence obtain higher performance. While Knowledge Based View recognizes the fact that management is a process that integrates knowledge acquisition, application and dissemination for competitive advantage, it fails to underscore the significance of access to the resource and the underlying importance of the combination of specific resources in driving firms to competitive advantage.

2.2 Project Design Documents and Performance of a Project

Project performance is the basis for determining the degree of achievement of established objectives in a meaningful way United States Agency for International Development (USAID, 2010). A good project implementation plan should ensure the project plan is arrived on time, on scope, on budget and meeting end user satisfaction besides other pertinent considerations (Cropper, Berg, Culligan, & Radstone, 2010). Within the professional discipline of project management there are tools, skills and processes that exist to help project managers develop comprehensive and appropriate documents that are essential to the successful implementation of the project leading to project performance.

Cleland & Ireland, (2017) opined project performance largely depends on overcoming the main influences that impede achievement of the desired project goals and objectives. Therefore, for project performance to be realized, all the factors and influences directly affecting it must be eliminated or alternatively minimized to a smaller scale that does not have any significance to be bearing on its performance.

Furthermore, according to Menoka, (2014) did a study on stakeholder involvement in documentation and sustainability related to project performance in construction. The study sought to improve stakeholder involvement in documentation in construction project performance through achieving construction sustainability. A framework was developed and include different stakeholders with sustainability driven project performance. The research was conducted as an empirical investigation and the findings depicted that effective preparation and presentation of stakeholder involvement contributes to improve the construction project performance through achieving the construction sustainability. The study found also that there is variation of perception of projects participants' roles, stakeholder involvement, and construction sustainability and construction project performance towards organizations.

This implied that involvement can be valuable in anticipating the expectations of different stakeholders from the projects

2.3 Conceptual Framework

A conceptual framework is a hypothesized model identifying the concepts under study and their relationships (Mugenda & Mugenda, 2009). A conceptual framework provides an outline of the preferred approach in the research and outlines the relationships and the desired effects, forming independent and dependent variables respectively. The conceptual framework is a diagrammatical presentation of variables in the study. The framework illustrates the interrelationship between dependent and independent variables. The independent variable for the study is project design framework documents while the dependent variable is project performance.

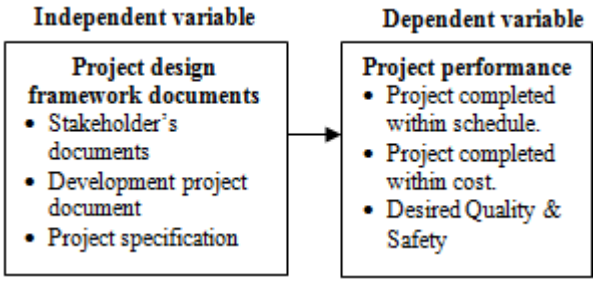

Figure 1: Conceptual framework

3. Methodology

A survey was conducted using a questionnaire on 110 top managers randomly sampled from a total of 150 managers operating in 9 construction sites. The data collected was coded and analysed through SPSS (statistical package for social sciences) version 21. For descriptive and inferential statistics.

4. Results and Findings

4.1 Demographics

This section contains the analysis of information on respondent's gender, age, education level, duration working at the project and the department where they work. Table one shows the representation of demographic. The study found that majority of the respondents as shown by 55% were male whereas 45% of the respondents were female, this is an indication that both genders were involved in this study and thus the findings of the study did not suffer from gender bias. From the findings, it was found that most of the respondents as shown by 14.2 % of the respondents were aged below 25 years, 48.6% of the respondents were aged between 26 to 35 years, 29.5% were aged between 36 to 45 years and finally 7.6% of the respondents indicated that they were aged over 45years.This is an indication that respondents were well distributed in terms of their age. The study results revealed that 11.4% of the respondents had acquired a diploma, 62.9% of the respondents indicated that they had acquired bachelor's degree, while 25.7% had acquired post graduate level of education as their highest level of education. Given the education levels of the respondents, majority possessed university degrees meaning they were competent and qualified employees.

Results indicated that 14.3% of the respondents had worked in the government projects for a period of less than five years, 41.9% of the respondents had worked in the media industry for a period of 5 to 10 years, 23.8% of the respondents had worked in the government projects for a period of 10 to 15 years whereas 20% of the respondents had worked in the government projects for a period of more than 15 years.

Table 1: Demographic information

	N	%
Gender		
Male	57	55
Female	48	45
Total	105	100
Age		
<25 years	15	14.2
26-35 years	51	48.6
36-45 years	31	29.5
Above 45	8	7.6
Total	105	100
Education level		
Diploma	12	11.4
Undergraduate	66	62.9
Postgraduate	27	25.7
Total	105	100.0
Trained Manager		
Yes	90	85.7
No	15	14.3
Total	105	100
Duration of working in projects		
<5	15	14.3
5-10	44	41.9
10-15	25	23.8
>15	21	20.0
Total	105	100

4.2 Project Design documents and government project performance

The respondents indicated their opinions on the project design documentation and project performance as presented in Table 2. The research sought to establish the level at which respondents agreed on the above statements relating to project design, and from the research findings majority of the respondents strongly agreed that; the project had clear specifications as shown by a mean of 4.48, the design of organized project documentation by a mean of 4.25, Others stated that designing the project involved a team with multiple stakeholders as shown by a mean of 4.20, problems and needs were identified and 36 solutions strategized as shown by a mean of 4.17 and impartial reviews were conducted to ensure specifications are met as shown by a mean of 4.06.

Table 2: Project design and government project performance

Statements	Mean	Std. Dev
The project had clear specifications	4.48	0.29
Standards to be achieved were clearly defined	4.22	0.24
Past experience and relevant data were used in	4.24	0.23

designing project		
Only qualified resources were specified in the design	4.27	0.27
Impartial reviews were conducted to ensure specifications are met	4.06	0.23
The design of organized project documentation	4.25	0.26
Designing the project involved a team with multiple stakeholders	4.20	0.24
Clear basic schedules and budgets developed	4.21	0.23
Problems and needs were identified, and solutions strategized	4.17	0.26
There were clear and measurable indicators of project progress	4.38	0.26

4.3 Correlation Results

Pearson Correlation coefficient of project design documentation on the performance of government projects were computed to establish the relationship between project design documentation and the performance of government projects. The findings are summarized in Table 3.

Table 3: Pearson Correlation of project design documentation versus performance of government projects

		Project design documentation	Performance of government projects
Project design documentation	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	105	
Performance of government projects	Pearson Correlation	.550**	1
	Sig. (2-tailed)	.000	
	N	105	105

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

From the Table 3, the results indicated that positive correlation coefficient of 0.550 existed between project design documentation and the performance of government projects.

4.4 Regression Analysis

A regression model was applied to establish whether there exists a significant relationship between project design documents and the project performance. The regressions model used in this study was: $Y = \alpha + \beta 1X1$ Where Y= Dependent variable – Performance of project, β = Coefficient of the Disbursement X1 = Project Design document and α is the constant.

Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable. From the findings in the below table, the value of adjusted R squared was 0.736 an indication that there was variation of 73.6 percent on performance of projects in Gasabo District due to poor project design documents. This shows that 73.6 percent changes in Government projects in Gasabo District could be accounted to project design. R is the correlation coefficient which shows the relationship between the variables in the study. From the findings shown in the table, it is notable that there exists strong positive relationship between the study variable as shown by 0.899.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.790	.736	.05

a. Predictors: (Constant) Project Design
b. Dependent: Performance of projects

The study further tested the significance of the model by use of ANOVA technique. The findings are tabulated in Table 4. From the ANOVA statistics, the study established the regression model had a significance level of 0.001% which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. The calculated value was greater than the critical value (3.814>1.997) an indication that project design affects the performance of projects in Gasabo District. The significance value was less than 0.05 indicating that the model was significant.

Table 5: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.996	4	3.499	3.814	.001[b]
	Residual	45.288	72	.629		
	Total	59.284	76			

Critical value =1.997
c. Predictors: (Constant) Project Design
d. Dependent: Performance of projects

Table 6: Regression Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.721	.428		4.125	.000
	Project design	.117	.156	.163	3.215	.023

From the data in the above table the established regression equation was $Y = 0.721 + 0.117\ X_1$

From the above regression equation, it was revealed that holding project design to a constant zero, the performance of Government projects in Gasabo District would be at 0.721, a unit increase in project design would enhance performance of Government projects in Gasabo district by a factor of 0.117. All the variables were significant as their significant value was less than ($p<0.05$).

5. Discussions

The findings are in line with Amponsah (2012), who sated that poor project design is a factor that can lead to project failure. All projects, whether successful or otherwise, revolve around the people involved at all levels. Relatively, few projects fail for technical reasons. Most fail because they are not effectively managed. The most important and complex aspect of the management task is managing relationships amongst the people involved.

On the influence of project design on performance of the projects, the study established that the project had clear specifications and there were clear and measurable indicators of project progress. It further revealed that only qualified resources were specified in the design and the

design had effective change control. The research indicated that past experience and relevant data were used in designing project and the standards to be achieved were clear. Designing the project involved a team with multiple stakeholders who identified problems and needs of the projects and strategized their solutions.

6. Conclusions and Recommendations

The study concluded that past experience and relevant data were essential in designing project and the standards to be achieved should be clear since they influence the performance of government projects in the District. In addition, the achieved plans should be clear since they influence the performance of government projects in the District. The study further concludes that the regulatory and legal conditions should be clear to the project team and a clear plan outlining timeframe for acquiring the products should be in place since it also affects performance of government projects in the District.

On the bases of the findings the study recommends that specifications given in project design should be followed to ensure that projects meet the standards set by the stakeholders. There is also a need for quality management to be taken seriously when dealing with project design documents. Further, the project design implementation and practice should be seen as the need to produce quality products; as well as the responsibility of everyone in the organization and the government. Since managers will want to implement this concept, employees may know little or nothing about quality management on project design documents therefore communication which is very essential comes in play. In this regard, careful implementation and attention ought to be given to the human capital and leadership. The proper analysis of project design documents must not be ignored as adequate information from customers will aid in proper direction of the firm in its production policy.

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