

Application of Gantt Chart as a Strategy for Improving Performance of Community Based Projects in Bugoma County, Kenya

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Abstract: *The main objective of this paper was to investigate the extent to which application of Gantt chart influences performance of community-based projects in Kenya County. The paper used the descriptive research design. Out of the targeted population of 192 respondents, 128 of them were considered in this study as the desired sample obtained through a stratified random sampling process from a number of community-based organisations within the country. The data collection was performed through a structured questionnaire and an interview guide. Qualitative data was analysed and grouped into similar themes and patterns then summarised and linked to the study objective and hypothesis. Equally, quantitative data was first cleaned and checked for consistency before analysis using descriptive and inferential statistics. The study findings were then presented in tables showing means and standard deviations. The relationship between the study variables were then shown through the carl pearson moment of correlation (r) and the regression statistics. The Fishers - F - test was then used to test the study hypothesis. A detailed test of the statistical assumptions was first performed before carrying out any further analysis. The study results indicate that coefficient was $R^2 = 0.112$, $F(4.177)$ at $p = 0.03 < 0.05$. This signified that H_0 was rejected and it was concluded that application of Gantt chart has a statistically significant influence on the performance of community-based projects. This paper concluded that the indicators for Gantt chart were project resources, work accomplished and time taken. The most dominant indicator was project time taken followed by project work accomplished and project resources. The results indicate that project resources had no statistically significant influence on the performance of community-based projects. Work accomplished had no statistically significant influence on the performance of community-based projects. Time taken had statistically significant influence on the performance of community-based projects. Overall, application of Gantt chart had a statistically significant influence on the performance of community-based projects. It was recommended that owing to the fact that project management is a challenging task with many complex responsibilities and relevantly project design tools and techniques, project managers should choose a project management tool that best suits their management style. If the Gantt chart is drawn up along with suitable milestones of work accomplished by using some special symbol such as brightly coloured diamonds, and the chart is kept in some centrally visible place, it would motivate all the people to achieve them. Finally, the results of this paper supplement the Project Management Body of Knowledge by providing valuable informative notes to the project practitioners on the relevance of the application of Gantt chart as a project design tool with more emphasis on the performance of community - based projects.*

Keyword: Gantt Chart, Project Design Tools, Performance of Community Based Projects

1. Introduction

Development of overall performance the world over has emerge as ever more essential to the success of projects and has been the concern of a considerable amount of studies and interest during the last decades. Regardless of the reality that globally there are a number of projects that have been carried out properly, there's but a issue related to the common and prolonged delays which have triggered under - fulfillment in project overall performance which relate to project layout (Al - Kharashi & Skitmore, 2009). In a big and complex project, design frequently entails more than one individuals or groups participating in a design process, sharing design data, negotiating and making decisions, coordinating and handling design obligations and activities (SAD, 2008). Consequently, the effectiveness of collaborative design procedure will become vital for design project management. At the same time, the way to enhance the effectiveness of a collaborative project design is a tough

issue within the discipline of collaborative design with the intention to enhance performance (Kalsaas, 2012).

Performance of a project is considered as a source of concern to both public and private sector clients. Improving project performance in the community poses several challenges for stakeholders. Additionally, it is not an easy task to sustain radical improvement in a diverse environment. It requires the identification and implementation of suitable improvement programmes subjected to the community business cycle (Wellman, 2011). This is important since the integration of improvement programmes in a community may lead to high cost and yet the benefit can only be realized in the long term. However, there is a need for new improvement programmes and initiatives at various stages of a project life - cycle in order to enhance community project performance and target changing trends of private and public sector project organizations (Thake, 2012).

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Performance of CBPs in Kenya remains wanting largely due to limitations such as finance, constraints of the environment and lack of management and technical expertise (Odindo, 2009). Moreover, constant pressures of fundraising, weak management skills and difficulties in scaling - up operations can limit CSPs' effectiveness and accountability. Silverman (2008) indicated that aspects such as local networks of CBPs, leadership, client characteristics, staff and strategy can have an influence on the success of their programmes. The development and exploitation of managers' social networking relationships with external entities affects performance of those organizations. Such social networks create social capital for organizations by establishing avenues for the exchange of valuable information, resources, and knowledge.

A Gantt chart is a sight view of tasks scheduled over time (Navon, 2005). Gantt charts are used for making plans projects of all sizes and they're a beneficial manner of displaying what work is scheduled to be accomplished on a selected day with the intention to enhance project performance. They define all of the duties involved in a project, and their order, shown against a timescale. This offers an instantaneous assessment of a project, its related tasks, and whilst these need to be completed (Booker, 2007). Wilson (2003) argues that Gantt charts do not provide beneficial data until they encompass all the activities needed for a task or project design segment to be completed. The chart displays the relationship among the duties in a project. Some tasks will need to be finished before you'll be able to begin the subsequent ones, and others can't stop until preceding ones have ended (Campbell, 2006).

Gantt charts are beneficial for planning and scheduling initiatives. They help examine how long a project ought to take, decide the assets needed, and plan the order wherein one will complete tasks (Chandes, 2010). They are additionally useful for dealing with the dependencies among tasks. They are useful for monitoring a project's progress as soon as it is underway, too. You will straight away see what ought to have been accomplished by a certain date and, if the task is delayed, one could take action to deliver it again on course (Mkutu, 2011).

1.1 Statement of the Problem

The introduction of reform to the project design process in order to improve the performance of community based projects has been ongoing. Although there have considerable project designs underway, there is a concern associated with the frequent and lengthy delays that have caused underachievement in project performance among projects being undertaken in Bungoma County (Mkutu, 2011). Effective use of project design tools is considered one of the key aspects of project performance. Project management is a challenging task with many complex responsibilities and the relevant project design tools and techniques. Despite the fact that there are many tools available to assist with accomplishing the tasks and executing the responsibilities, project managers face a problem of choosing the best project design tool that suits their management style and addresses all project management needs (Silverman, 2008). Even with the continuous efforts to ensure community based projects

guarantee performance and success, failure to have in place effective project designs and other avoidable factors from initial stages to performance completion is still too low. The improvement of performance of community based projects has become ever more critical to the success of projects and has been the subject of a considerable amount of research and attention over the past two decades.

Blood (2013) did a study on the imminent problems inducing ineffective stakeholders' engagement in mining projects, the study only dealt with the imminent problems inducing ineffective stakeholders' engagement in mining projects. It did not address the interaction of project design tools, project manager's competencies and performance of community based projects. A study by McCawley (2014) on why conducting a problem tree is an important aspect for project managers only dealt with conducting a problem tree and why it is an important aspect for project managers. It did not address the interaction of project design tools and project manager's competency levels with performance of community based projects. Stare (2012) on the other hand carried out a study to establish the impact of the organizational structure and project organizational culture on project performance in Ugandan enterprises, the study only dealt with establishing the impact of the organizational structure and project organizational culture on project performance. It did not address the interaction of project design tools, project manager's competencies and performance of community based projects. With this in mind the current study sought to establish the influence of application of Gantt charts, managers' competencies and performance of community based projects in Kenya.

1.2 Objectives of the Study

The main objective of the study was to investigate how application of Gantt chart influences performance of community based projects in Kenya.

1.3 Research Hypothesis

The following research hypothesis guided this study paper:
H₀₁: Application of Gantt chart does not have a significant influence on performance of community based projects in Kenya

2. Literature Review

Geraldi and Lechter (2012) argue that Gantt charts are a very useful tool for project management used to keep track of progress for each activity and how the costs are running. Gantt charts break a project down to a succession of tasks and assign each task to a different row along the vertical axis, according to Gcek (2008). He argues that the horizontal axis spans the expected duration of the project, with dates written along the top in hours, days, weeks or whatever time frame is most appropriate. A horizontal bar outlines the expected duration for each task while the left side marks when the task begins, the right side marks the end. As work progresses, each bar is filled in according to how much work has been completed on each task. To figure out how the entire project is progressing, one need only draw a line

through the graph at the current date/time; each task's progress is thereby easily assessed.

On the influence of information technology application on project resource management by Khosrow - Pour (2010) with a focus on the application of Gantt charts established that Gantt chart was influential in ensuring project success through effective resource management in Boston. The study results noted that the importance of project management integration including project scope management, project time management, project cost management, project quality management, project human resources management, project communications management, project risk management and project procurement management. Despite the findings from the study being relevant for effective project implementation, it was conducted in a different geographical location and thus the current study sought to establish whether the results from the study can be affirmed within the Kenyan context.

In seeking to establish the impact of the organizational structure and project organizational culture on project performance in Slovenian enterprises, Stare (2012) conducted a study the goal of the research being to identify the level of project organizational culture in Slovenian enterprises. The study also analysed the strength of the impact of the culture on project execution. The research was focused on the top and line management's attitudes and some other factors connected with managers' attitudes following the internal regulations, respecting the project manager's formal authority. The researcher also investigated the most common project organization types and the correlations among the organization, culture and project performance. The research showed a high level of project organizational culture and a high impact level of measured culture factors on project performance. An increasing level of project manager authority in different organization types positively impacts on several cultural dimensions and also has a direct impact on the project's performance. This study was conducted in Slovenian enterprises whereas the current study seeks to examine the influence of project management application tools on project performance within the Kenyan context narrowed to resources involved in a project.

On the usefulness of Gantt chart in project management Gupta (2013) found out that while a Gantt chart can be useful to cope with some of the complications of projects, and embraces the importance of time and timing, it is based on principles that are not valid to all projects. The consequence is a propagation of a management approach that does not explicitly cope with complexity, ambiguity, uncertainty and change. In that respect, the Gantt chart fails to acknowledge insights from years of organization theory research and project management research with a firm grounding in contingency theory. This study sought to establish whether these findings were factual using the Kenyan context.

2.1 Theoretical Framework

The resource - based view (RBV) of the firm was first proposed by Wernerfelt. He postulated that with effective planning of strategic resources and core competencies by the

firm, sustained competitive advantage are achieved leading to superior firm performance. Collis and Montgomery (2014) supported the RBV proposition when they analysed competitive advantage from the resource - based view perspective, concluding that resources and capabilities are valuable source of sustained competitive advantage if well managed and planned for. However, Tarboda (2010) suggested that these characteristics of firm resources and capabilities cannot sustain competitive advantage since competitors will soon begin to acquire the same resources through imitation or substitution. From a corporate strategy point of view, Pearce and Robinson (2007); and Peteraf and Bergen (2003) argued that the firm's resources and core competencies fundamentally determine firm strategies and the plans that an organization has in place. Hoffmann (2010) contends that for a firm to arrive at a better determined corporate strategy, it is important to conceive its resources as capacities towards superior performance. On his part, Leiblein (2003) argued that the RBV contemplates how firm resources are allocated and deployed in corporate strategy plans. Therefore, firm corporate strategy can be established by focusing on integration of firm resources (Furrer, Thomas and Goussevskaia, 2009). According to Peteraf and Bergen (2003) the purpose of corporate strategy is to manipulate strategic resources and core competencies into new configurations to acquire and sustain competitive advantage. Therefore, firms have to determine the correct corporate strategies based on strategic resources and core competencies (Tarboda, 2010). However, some scholars have criticized the theory. For instance, Lockett, Thompson and Morgenstern (2009) argued that the RBV assumes that firms are profit maximizing entities operating in distinctive markets with the assumption that the future value of firm resource is asymmetrically distributed through planning. Other critiques include that RBV has no competitive implications in unpredictable and unstable environments (Hoffmann, 2010). Further, Miller (2003) suggested that only firms that already possess valuable, rare, inimitable and non - substitutable (VRIN) resources can acquire and apply additional resources towards competitive advantage for future performance. This theory supports the current study in articulating a systematic planning procedure for complete project cycle management including designing. This is in addition to the wider planning procedures of problem tree analysis, the development of objectives and indicators, and identification of risks and assumptions, which feed into the overall programme plan.

2.2 Performance of Community Based Projects

Project performance is different from industrial or manufacturing sector performance owing to the unique structural nature of the projects. However, like the operations of other sectors, project construction performance can be achieved through evaluation against suitable criteria, monitoring and evaluation or benchmarking against set standards or previous performance of similar projects (Ogunlana, 2013). Key criteria against which the project performance can be evaluated include; whether it is relevant, efficient, effective, whether it has impacted the beneficiaries and whether the interventions are sustainable (Hill, 2015).

Kerzner (2009) stated that project performance measurement means an improvement of cost, schedule, and quality for design and construction stages. Long *et al.* (2014) stated that a project performance measurement is related to many indicators such as time, budget, quality, specifications and stakeholders' satisfaction. They remarked that performance problems arise in large construction projects due to many reasons such as: incompetent designers/contractors, poor estimation and change management, social and technological issues, site - related issues and improper techniques and tools.

Community - based organizations are increasingly becoming a pillar in facilitating development, especially in third world countries. Mkutu (2011) observes that for projects to perform well, there is need for a close cooperation between the CBP and the community. They ought to work towards the same goal and share the same interests. He also adds that mean performance against budget (4% cost escalation) is generally better than mean performance against schedule (16% late); and when the adequacy of specific project management practices and the maturity of specific project management processes are compared with performance against each of these two criteria, different practices are found to correlate significantly. McKinney (2012) asserts that the internal environment of any organization comprises firm - related factors that influence its capacity to achieve set objectives, develop and implement a viable plan, which consequently contributes to its performance.

3. Methodology

This study used the descriptive survey research design since subjects or participants are observed in a natural and unchanged environment and the design may be a pre - cursor to future research because it can be helpful in identifying

variables that can be tested. The study had targeted a population of 96 community based project which had just been completed at the time of the study. Only 15 project of these had met the criterion set of funding, number of employees and magnitude which meant that the working sample of projects was 15. A sample of 128 respondents was chosen from the members of staff of the 15 projects using simple random sampling while a sample of 15 project managers was purposively chosen for the qualitative interviews. The study made use of both the structured questionnaires and interview guide as the data collection instruments for both quantitative data and qualitative data respectively. Qualitative data was analysed according to the content matter of subject matter at hand and then responses with re - occurring and common themes grouped together in continuous pros. The quantitative data on the other hand was analysed using spss and both descriptive and inferential statistics was applied to describe the results. The results were presented in tables showing frequencies, means and standard deviations as well as correlation statistics and regression analysis was applicable in showing relationships between the variables.

4. Results and Discussions

The study sought to establish the extent to which utilization of Gantt charts influences performance of community-based projects within Kenya. The respondents were therefore asked to state their perceptions on project resources, work accomplished and time taken as discussed in subsequent sections. Project resources were measured by providing respondents with statements rated on a five - point Likert scale ranging from Strongly Disagree (SD); Disagree (D); Neither Agree Nor Disagree (NAD); Agree (A) and Strongly Agree (SA) from which to choose. The findings are presented in Table 1.

Table 1: Project Resources and Performance of Community Based Projects

Statements	SD F (%)	D F (%)	NAD F (%)	A F (%)	SA F (%)	Mean	SDV	Total F (%)
Resources needed for the project are sought before project commencement	3 (2.9)	4 (3.9)	6 (5.8)	9 (8.7)	81 (78.6)	4.5631	0.97689	103 (100)
Resources identified meet economic requirements of the project	2 (1.9)	2 (1.9)	4 (3.9)	16 (15.5)	79 (76.7)	4.6311	0.81638	103 (100)
Project schedules are present	13 (12.6)	7 (6.8)	5 (4.9)	5 (4.9)	73 (70.9)	4.1456	1.47135	103 (100)
Resource allowance is made on each activity	3 (2.9)	2 (1.9)	4 (3.9)	14 (13.6)	80 (77.7)	4.6117	0.88819	103 (100)
Top management approve resource allocation	4 (3.9)	2 (1.9)	2 (1.9)	15 (14.6)	80 (77.7)	4.6019	0.93242	103 (100)
Composite for Project Resources						4.51068	1.01704	

The results show that 81 (78.6%) of the respondents strongly agreed that resources needed for the project are sought before project commencement; 9 (8.7%) of the respondents agreed that resources needed for the project are sought before project commencement; 6 (5.8%) of the respondents neither agreed nor disagreed that resources needed for the project are sought before project commencement; 4 (3.9%) of the respondents disagreed that resources needed for the project are sought before project commencement and 3 (2.9%) of the respondents strongly disagreed that resources needed for the project are sought before project commencement. Further, 79 (76.7%) strongly agreed that resources identified meet economic requirements of the project; 16 (15.5%) agreed that resources identified meet economic requirements of the project; 4 (3.9%) neither

agreed nor disagreed that resources identified meet economic requirements of the project; 2 (1.9%) disagreed that resources identified meet economic requirements of the project; and 2 (1.9%) strongly disagreed that resources identified meet economic requirements of the project. Overall, the surveyed employees agreed ($M=4.51$, $SDV=1.02$) that project resources influences community based projects performance. The results imply that project resources are very important in the performance of community-based projects since without the right resources the project cannot commence operations.

Work accomplished was measured by providing respondents with statements rated on a five - point Likert scale ranging from Strongly Disagree (SD); Disagree (D); Neither Agree

Nor Disagree (NAD); Agree (A) and Strongly Agree (SA) from which to choose. The findings are presented in Table 2.

Table 2: Work Accomplished and Performance of Community Based Projects

Statements	SD F (%)	D F (%)	NAD F (%)	A F (%)	SA F (%)	Mean	SDV	Total F (%)
Type of work accomplished within time is captured	1 (1.0)	3 (2.9)	7 (6.8)	7 (6.8)	85 (82.5)	4.6699	0.80912	103 (100)
Amount of work accomplished thin time is recorded	4 (3.9)	2 (1.9)	5 (4.9)	7 (6.8)	85 (82.5)	4.6214	0.96117	103 (100)
Work accomplished after time is reviewed	1 (1.0)	3 (2.9)	1 (1.0)	7 (6.8)	91 (83.3)	4.7864	0.69523	103 (100)
Project matches skilled workers to appropriate jobs	2 (1.9)	2 (1.9)	3 (2.9)	6 (5.8)	90 (87.4)	4.7476	0.77609	103 (100)
Absenteeism of staff is high in the project	4 (3.9)	1 (1.0)	10 (9.7)	8 (7.8)	80 (77.7)	4.5437	0.98793	103 (100)
Composite for Work Accomplished						4.6738	0.84591	

The results show that 85 (82.5%) of the respondents strongly agreed that type of work accomplished within time is captured; 7 (6.8%) of the respondents agreed that type of work accomplished within time is captured; 7 (6.8%) of the respondents neither agreed nor disagreed that type of work accomplished within time is captured; 3 (2.9%) of the respondents disagreed that type of work accomplished within time is captured; and 1 (1.0%) of the respondents strongly disagreed that type of work accomplished within time is captured. Further, 85 (82.5%) strongly agreed that amount of work accomplished within time is recorded; 7 (6.8%) agreed that amount of work accomplished within time is recorded; 5 (4.9%) neither agreed nor disagreed that amount of work accomplished within time is recorded; 2 (1.9%) disagreed that amount of work accomplished within time is recorded; and 4 (3.9%) strongly disagreed that

amount of work accomplished within time is recorded. Overall, the surveyed employees agreed (M=4.67, SDV=0.84) that work accomplished influences community-based project performance. The results imply that work accomplished is very important in the performance of community-based projects since less work is accomplished than planned for will influence how the project performs both in the short and long term.

Time taken for the project was measured by providing respondents with statements rated on a five - point Likert scale ranging from Strongly Disagree (SD); Disagree (D); Neither Agree Nor Disagree (NAD); Agree (A) and Strongly Agree (SA) from which to choose. The findings are presented in Table 3.

Table 3 Time Taken and Performance of Community Based Projects

Statements	SD F (%)	D F (%)	NAD F (%)	A F (%)	SA F (%)	Mean	SDV	Total F (%)
Amount of time taken to accomplish task is monitored	2 (1.9)	2 (1.9)	10 (9.7)	10 (9.7)	79 (76.7)	4.5728	0.89225	103 (100)
There is a lot of reworking in the project	2 (1.9)	1 (1.0)	3 (2.9)	8 (7.8)	89 (86.4)	4.7573	0.73386	103 (100)
Schedules which meet deadlines are identified	2 (1.9)	2 (1.9)	2 (1.9)	11 (10.7)	86 (83.5)	4.7184	0.77228	103 (100)
Timelines are identified	6 (5.8)	2 (1.9)	2 (1.9)	11 (10.7)	82 (79.6)	4.5631	1.05412	103 (100)
There are frequent project design changes	2 (1.9)	0 (0)	3 (2.9)	9 (8.7)	89 (86.4)	4.7767	0.68502	103 (100)
Composite for Time Taken						4.6776	0.82756	

The results show that 79 (76.7%) of the respondents strongly agreed that the amount of time taken to accomplish task is monitored; 10 (9.7%) of the respondents agreed that amount of time taken to accomplish task is monitored; 10 (9.7%) of the respondents neither agreed nor disagreed that amount of time taken to accomplish task is monitored; 2 (1.9%) of the respondents disagreed that amount of time taken to accomplish task is monitored; and 2 (1.9%) of the respondents strongly disagreed that amount of time taken to accomplish task is monitored. Further, 89 (86.4%) strongly agreed that there is a lot of reworking in the project, 8 (7.8%) agreed that there is a lot of reworking in the project, 3 (2.9%) neither agreed nor disagreed that there is a lot of reworking in the project, 1 (1.0%) disagreed that there is a lot of reworking in the project, and 2 (1.9%) strongly disagreed that there is a lot of reworking in the project. Overall, the surveyed employees agreed (M=4.68, SDV=0.83) that time taken influences community-based project performance. The results imply that time taken in a project is very important in the performance of community-based projects since time is an important aspect in community-based projects.

projects are shown in Table 4. The following have been considered under Gantt chart: project resources, project work accomplished and project time taken.

Table 4: Means and Standard Deviations for Gantt Chart

Components of the use of Gantt Charts	n	Mean	SDV
Project Resources	103	4.51068	1.01704
Project Work Accomplished	103	4.6738	0.84591
Project Time taken	103	4.6776	0.82756
Overall use of Gantt Chart analysis		4.6207	0.89683

The study results show that the overall mean for Gantt chart was 4.62 and the standard deviation was 0.90. The most dominant indicator was project time taken (M=4.68, SDV=0.83), followed by project work accomplished (M=4.67, SDV=0.85) and project resources (M=4.51, SDV=1.02). This implies that Gantt chart is very important in the performance of community-based projects because road without proper planning in regard to resources, work accomplishment and time taken for activities project cannot succeed.

Correlational analysis using Pearson's Product Moment technique was done to determine the relationship between Gantt chart and performance of community-based projects.

The overall findings on the extent to which utilization of Gantt charts influence performance of community-based

It was meant to identify the strength and direction of the association between the indicators of Gantt chart and performance of community-based projects. The results are summarized in Table 5.

Table 5: Gantt Chart Correlation Results

	Performance of Community Based Projects	Application of Gantt Chart
Performance of Community Based Projects	1	0.637*
Application of Gantt Chart	0.637*	1

*Correlation significant at 0.05 level (2 tailed)

The correlation results indicate that the indicators, namely, project resource and work accomplished which had been transformed into one composite variable for application of Gantt Chart had some level of association with performance of community-based projects. Application of Gantt Chart had a Pearson correlation coefficient of 0.637 depicting a moderately strong level of association with performance of community-based projects.

Regression analysis was used to establish the influence of application of Gantt Chart on performance of community-based projects. Hypothesis testing using p value was used because it gave the strength of the decision. The p values were used to measure the hypothesis of the study. According to (Mugenda & Mugenda, 2012) a significance level of 0.05 is preferred because it represented the results to be at 95% confidence level. The regression analysis results were presented using the model summary, analysis of variance (ANOVA) and the beta coefficients tables

The following hypothesis was tested using simple regression model to satisfy the requirements of the objective.

H₀: Application of Gantt charts does not have a significant influence on performance community based projects within Bungoma County.

The null hypothesis was tested using the following linear regression model:

$$Y = \beta_0 + \beta_4 X_4 + e_4$$

Where:

Y= Performance of Community Based Projects

β_0 =regression constant

X₄= Gantt Charts

e₄= error term

The results are presented in Table 6.

Table 6: Model Summary for Application of Gantt Chart

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
dimension 1	0.335	0.112	0.058	0.94475

a. Predictors: (Constant), Gantt Chart

The regression model summary on application of Gantt chart versus the performance of community-based projects in Kenya. As presented in the table, the coefficient of determination R square is 0.335 and R is 0.112 which is taken at 0.05 - level of significance. The Coefficient of determination R indicates that 11.2% of the variations in performance of community-based projects are explained by the application of Gantt chart. This implies that there exists a significant relationship between application of problem

Gantt chart and performance of community-based projects in Kenya.

Table 7: Analysis of Variance (ANOVA) for Gantt Chart

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.317	3	2.772	4.177	.030
	Residual	88.363	99	.893		
	Total	96.680	102			

a. Dependent Variable: Performance of community-based projects

b. Predictors: (Constant), Application of Gantt Chart

The analysis of variance (ANOVA) results confirms further that the model fit is appropriate for this data since the p - value of 0.03 is less than 0.05. This implies therefore that the overall F (8.177) with p<0.05 indicates that we reject the Null hypothesis and show that there exists a significant relationship between the application of Gantt Chart and performance of community-based projects in Kenya.

Table 8: Regression Coefficients: Gantt Chart

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.371	0.15	0.171	9.143	0.000
	Gantt Chart	0.5	0.34		3.193	0.002

a. Dependent Variable: Performance of Community based projects

The results further indicated that the application of Gantt chart has a positive significant influence on performance of community-based projects. The fitted regression model Y= 1.371+0.50X. This implies that for every unit increase in application of Gantt chart the level of performance of community-based projects increases by 0.50. Even when application of problem tree analysis is not applied, the performance of community-based projects would still be significant at 1.371 units. This indicates that there were still other factors driving performance such as logical framework, application of Problem Tree analysis, stakeholder analysis and managers competencies among others.

The overall F - statistic was (4.177) with p=0.03<0.05, suggesting that there was a statistically significant relationship between application of Gantt chart and performance of community-based projects. Based on the research findings, we reject the null hypothesis which stated that there is no significant relationship between the application of Gantt chart and performance of community-based projects; and conclude that application of Gantt chart has a statistically significant influence on the performance of community-based projects.

5. Conclusion

The indicators for Gantt chart were project resources, work accomplished and time taken. The most dominant indicator was project time taken followed by project work accomplished and project resources. The results indicate that project resources had no statistically significant influence on the performance of community-based projects. Work accomplished had no statistically significant influence on the

performance of community-based projects. Time taken had statistically significant influence on the performance of community-based projects. Overall, application of Gantt chart had a statistically significant influence on the performance of community-based projects.

6. Recommendations

The study results established that the application of Gantt charts influence the performance of community based projects. The implication of this is that effective use of Gantt charts as a project design tool is one of the key aspects of project performance. Owing to the fact that project management is a challenging task with many complex responsibilities and relevantly project design tools and techniques, project managers should choose a project management tool that best suits their management style. If the Gantt chart is drawn up along with suitable milestones of work accomplished by using some special symbol such as brightly - coloured diamonds, and the chart is kept in some centrally visible place, it would motivate all the people to achieve them.

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