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Factors Affecting Timely Project Completion of Public Construction Projects in Rwanda: Case of Ngoma-Ramiro Road Upgrading Project

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Abstract:
This research aimed to achieve the following four objectives; to examine the influence of resource allocation on timely completion of public construction projects, to find out the influence of project leadership on timely completion of public construction projects, to establish the influence of project planning on timely completion of public construction projects and to establish the influence of project monitoring on timely completion of public construction projects in Rwanda. This research is significant because the knowledge generated from it assisted in informing policy formulation by relevant authorities in the government of Rwanda in project planning process and implementation. The research was guided by the following theories; contingency theory, general systems theory, the ADKAR model and the utility theory. This research used survey research design with a sample of 32 respondents who were actively involved in construction projects in Ngoma eastern province of Rwanda as, project managers, contractors, suppliers, users and consultants. Upon completion of the data collection exercise, all completed research instruments were assembled, coded, summarized, entered into the computer; and analyzed using the statistical package for social science (SPSS). Both descriptive and inferential statistics were used for analysis. Qualitative data was analyzed using content analysis. Multiple regression analysis was used to determine whether independent variables can be used to test the relationship between the variables of the study. From the results of the study, the conclusion is that adequate resource allocation improves timely project completion however resource allocation has not been given the necessary attention it requires from the stakeholders. Effective resource utilization and use of new construction technologies like IBS-Industrialize System can improve project implementation. Public projects are overpriced, riddled with rogue contractors, payment of kickbacks to get contracts, cartels positioned around approving agencies and improper/irregular payments. This leaves the project team with little synergy to complete the projects on time and this is the reason for delayed projects. First, the government should ensure adequate resource allocation for all the projects they are undertaking. In addition, it should develop and implement avenues for reporting corruption and be committed towards zero tolerance to corruption. Second, the government should form agencies to deal with project implementation with responsibilities. These agencies will ensure that there is professionalism in project implementation and reduce political interference. Such agencies will ensure balanced public participation devoid of political interests. They will ensure that project planning is above board and follow the same to conclusion

Keyword: *Resource allocation, project leadership, project planning, project monitoring and timely completion.*

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I. Background

A project is delayed because the critical activities of the project were delayed. A delayed critical activity implies that the completion of the activity has been delayed because the activity was started later than expected and/or because the activity required an unexpectedly extensive duration to complete. Therefore, the causes of project delays can be identified through an examination of the causes that produce these delayed start times or extended durations (Yang *et al.*, 2013). There are severe criticisms of the industry when projects take far longer than planned (Jagboro & Ogunsemi, 2006). Chan and Kumaraswamy (1996) found out that seven eighths of the projects surveyed in Australia in the late 1960s were completed after schedule while in Hong Kong, 70% of the building projects were delayed. In Saudi Arabia Al-Khahil and Al-Ghafly (1999) observed that contractors agreed that 37% of all their projects were delayed while seven out of ten projects in Nigeria suffered delays during their execution (Jagboro & Ogunsemi, 2006).

In Jordan, Al-Momani identified the main causes of project delay as poor project design, change orders and weather. Change orders refer to design changes by the owner or his agent during the course of the construction. In Malaysia Yau et al identified improper planning, poor site management and inadequate

contractor experience while in Hong Kong, Tung et al identified inadequate resources due to lack of capital, unforeseen ground conditions and exceptionally low bids as the major factors that cause project delay. Kikwasi (2012) investigating the causes of delay and disruptions in construction projects in Tanzania, through questionnaire found that only 22%, 30% and 44% of the projects were completed on estimated time according to clients, consultants and contractors respectively while the maximum time overrun was 78%, 70% and 56% for clients, consultants and contractors respectively.

Rwanda is a developing country still at the stage of providing infrastructures such as health, education, agriculture and administrative as well as living facilities for its rapidly growing population (Vision 2030, 2007; Gwaya *et al.*, 2014). Munano (2012) did a study on factors that influence timeliness of project completion for public sector in Rwanda. Of the sampled projects, completion time exceeded by a mean of 209.8% and the projects were at an average of 87.54% of completion. According to the study the project that had the minimum percentage elapsed was 91% while the maximum was 481%. This indicates that a project could take up to a maximum of five times the expected time.

1.2 Problem Statement

There are a good number of construction projects in Rwanda at different stages of implementation (CIDP 2013-2017). There are however, conflicting views on the schedule performance of most of the projects with some stakeholders especially the intended users arguing that they are delayed while the implementers believe that they are on course (The Star, June 2016; The Standard, December 2014). According to Nixon citing Lim and Mohamed, for those involved with a project, project success is normally thought of as the achievement of some pre- determined project goal (Nixon *et al.*, 2012). Vision 2050 observes that infrastructure is important in improving the livelihoods of people and security of the country. One of the goals for 2020 (Vision 2020) was improving efficiency and effectiveness of the infrastructure development process at all levels of planning, contracting and construction. In pursuit of this goal the strategy was to strengthen institutional framework and accelerate speed of project completion. Raising efficiency and quality of projects and increasing the pace of implementation of projects so that they are completed in specified time frames. However, various organizations have been crying foul over the many projects whose performances fall below target and scarce resources go down the drain. The number of projects that have so far proved defunct and futile ventures in relation to their objectives is terribly alarming. The purpose of this research therefore was to investigate the factors affecting timely projects completion of public construction projects in Rwanda and to propose actions that can be implemented to prevent and resolve delay related issues.

1.3 Objectives

i. To examine the influence of resource allocation on timely completion of public construction projects in Rwanda.
ii. To find out the influence of project leadership on timely completion of public construction projects in Rwanda.
iii. To establish the influence of project planning on timely completion of public construction projects in Rwanda.
iv. To establish the influence of project monitoring on timely completion of public construction projects in Rwanda.

II. LITERATURE REVIEW

2.1 Contingency Review

Theory by Fred Edward Fiedler asserts that when managers make a decision, they must take into account all aspects of the current situation and act on those aspects key to the situation at hand. Each construction project is unique and with its own complexities and therefore should be managed according to its specific characteristics and environment in that particular period of time (Sawega, 2015). This theory recognizes that there are a range of contextual variables also referred to as risk factors which influence the project objectives differently. Examples of these variables are: external environment, technology, organizational structure and size, cost, culture, people involved and strategy. Contingencies for both budgets and schedules provide the project manager with the estimating caution they need to protect their projects from cost and time overruns (PMI, 2006). Effectively allocating these contingencies can help project managers control much of the projects uncertainties.

2.2 General Systems Theory

Theory by Bertalanffy Ludwig Von (1971) asserts that a system is a collection of parts unified to accomplish an overall goal. If one part of the system is removed, the nature of the system is changed as well. For example, a functioning car is a system if you remove the carburetor you no longer have a working car. A

project can also be viewed as a system with inputs, processes and outputs. Any project success is dependent on the harmonious interaction of its parts and therefore the project team must be able to put this into perspective. Improvement methods by Memon et al (2013) indicates that failure of different parties to a project to work seamlessly leads to infighting that eventually derail the completion of a project.

2.3 The ADKAR Model of Change

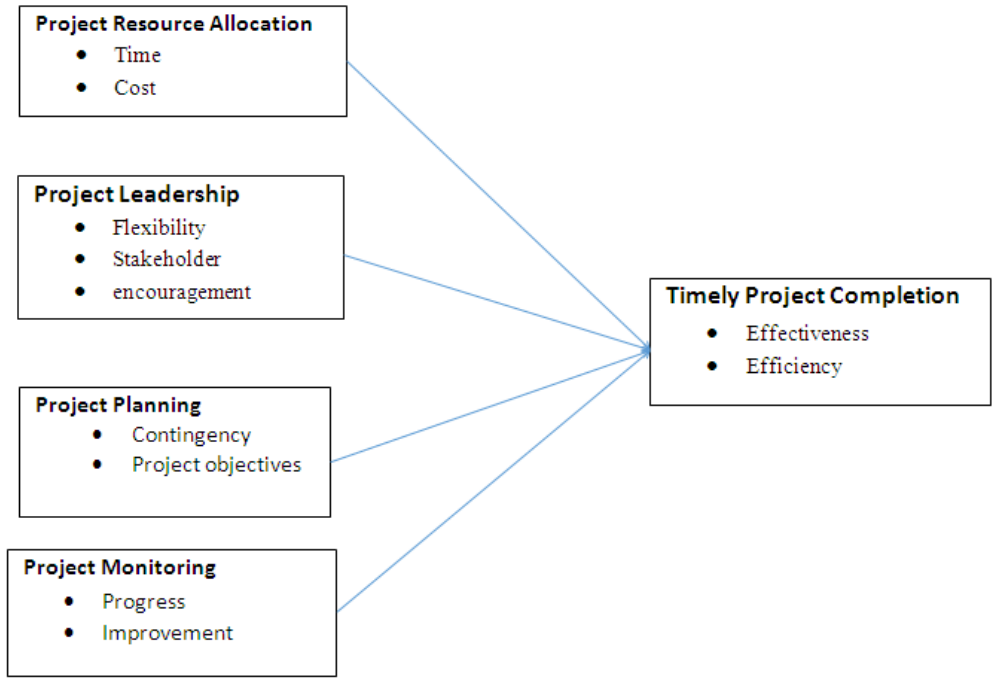
Hiatt (2006) developed the ADKAR model for change management based on his experience as an engineer and a project leader. According to him cited in Sawega (2015) project failure is caused by resistance to change and that effective management of this could enhance project success. The model will be based on many change management techniques but presented in one clear model with a key underlying message that the key to successful change is in understanding how to facilitate change with one person. ADKAR is an acronym for: A – Awareness of the need for change, D – Desire to support and participate in the change, K – Knowledge of how to change, A – Ability to implement the required skills and behaviors, R – Reinforcement to sustain change. All the five elements of the ADKAR model are sequential.

2.4 Utility Theory

Utility is a measure of desirability or satisfaction; a degree of satisfaction or welfare coming from an economic activity. Value of a project depends on its utility while utility depends on the specific circumstances of the stakeholders. The criteria of projects success should include longer term aspects of the project outcome such as its impact. According to PMI (2006) the project manager can use a utility- based approach to develop a long-range contingency allocation plan, an approach informed by the relationship between expected utility and the challenges in allocating a project's cost and time contingencies. This relates utility theory to contingency allocation to improve performance. Delay in project completion impacts negatively to the expected users in that it denies them the utility they would have had from the project were it complete on time.

2.5 Conceptual Framework

Independent Variable **Dependent Variable**



III. RESEARCH METHODOLOGY

3.1 Research design

This research used survey research design. Survey research design is appropriate when the target population is large (Kothari, 2004) like in this case where the target population is the entire construction projects being undertaken by the county government. The reason for this being to save on cost and increase accuracy since the researcher will have a better control of data collection errors (Mugenda and Mugenda2003). Survey research uses questionnaires or interviews to collect data from a sample that has been selected to represent a population to which findings can be generalized (Kothari, 2004).

3.2 Sample Size

In this study, the sample size for project employees and stakeholders are computed using **n = N / (1+Ne2).** Yamane formula: $n = N$ /1+$Ne2$ where n is the sample size, N is the population size and e is the margin of error at 90% confidence level and 10% the margin of error. Then, n = 35/1+35 (0.05)2 = 32.18 ≅32

N: Sample size=32

3.3 Target population

The sample population for this study was 32 respondents who were actively involved in construction projects in Ngoma eastern province as, project managers, contractors, suppliers, users and consultants. The study was set to determine the factors that affect timely projects completion of public construction projects in Rwanda.

3.4 Data Collection Source

The researcher self-administered the questionnaires to the respondents and conduct interviews with the assistance of trained research assistants. The data for the study was obtained from both primary and secondary sources. According to (Leed & Ormrod, 2005) data is said to be primary if it is collected first hand by researcher for a determined purpose. The primary data was collected by use of semi-structured questionnaires that were administered to selected respondents. The respondents were expected to possess the requisite knowledge of the subject matter.

IV. FINDINGS AND CONCLUSION

Summary of Findings

The study sampled 32 respondents who were actively involved in construction projects in Ngoma eastern province of Rwanda as, project managers, contractors, suppliers, users and consultants.

Project Resource Allocation

69% of the respondents interviewed agreed that adequate resource allocation improves timely project completion but when asked whether resource allocation to that particular project was adequate the data was split 50-50 for those who believe that it was adequate and for those that believe it was not. Similarly, all the respondents stated that financial problems and payments problems of completed work had actually led to project delays; in addition, the majority of the respondents (59%) stated that delay was caused by material procurement. This implies that resource allocation is an essential element in the process of project implementation. However, projects are overpriced riddled with rogue contractors, payment of kickbacks to get contracts, cartels positioned around approving agencies and improper/irregular payments. This leaves the project team with little synergy to complete the projects on time and this is the reason for delayed projects.

The results of the study show that project resource allocation has a significant influence on timely completion of public construction projects. This is despite the fact that about 50% of the projects had adequate resources and yet did not complete on time.

Project leadership

85% of the respondents agreed when asked whether strong leadership increases the chances of timely project completion. However, when asked to rate the strength of project leadership for that particular project, 10% chose to be neutral while 31% disagreed that the leadership was strong. This implies that despite project leadership being a very important ingredient in the process of project implementation what was on the ground was not measuring up to the task. Conversely, 66% of interviewees disagreed to the statement that restrictions at project site had impacted negatively on project implementation. The majority (84%) of the respondents blame the failure of project delivery on poor site management, supervision and poor project management. 62.6% agreed to the statement that clear communication can lead to timely project completion while another 68.8% felt that full utilization of the construction team could improve project implementation.

When further asked to give their suggestions on project leadership, the respondents observed that if there is a good relationship among the project stakeholders, timely project completion is more likely. Collective responsibility among project stakeholders and integrity in finance management was also prominently mentioned with relation to project leadership. The results of the study have established that project leadership has a significant influence on timely completion of public construction projects with a p-value of 0.04 (p value < 0.05).

Project Planning

56.4% of the respondents agree that the extent of project planning in that particular project that they were involved in was high, 25% were neutral while 19.2% rated the extent of project planning as being low. Despite that, 87.2% of the respondents agreed that project planning impacts on timely project completion. Asked to rate the extent to which poor project design affects the project schedule,71.4% rated the effect as high, while 19% as neutral. In addition, 62.6% rated the extent to which change orders affect the project schedule as

being high while 34.2% disagreed. Project planning was generally above average in the sampled projects. Others stated that project planning should be more inclusive to involve all the stakeholders and especially the community members who are the prime users of the projects in question. The results of the study have established that project planning has a significant influence on timely completion of public construction projects with a p-value of 0.02 (p value < 0.05).

Project Monitoring

When asked to state whether they consider the extent of project monitoring in the particular project to be high, 62% of the respondents disagreed. Conversely, 80.8% of the respondents believe that lack of a proper monitoring system was the cause of project delay. On improvement measures over 81% of the respondents believe that close monitoring of the project progress could improve the schedule performance of the project. The results of the study show that project monitoring has a significant influence on timely completion of public construction projects with a p-value of 0.0001 (p value < 0.05). This therefore indicates that lack of proper project monitoring is one of factors why projects are falling behind schedule.

General Conclusion

From the results of the study, the conclusion is that adequate resource allocation improves timely project completion however resource allocation has not been given the necessary attention it requires from the stakeholders. Effective resource utilization and use of new construction technologies like IBS-Industrialize System can improve project implementation. Public projects are overpriced, riddled with rogue contractors, payment of kickbacks to get contracts, cartels positioned around approving agencies and improper/irregular payments. This leaves the project team with little synergy to complete the projects on time and this is the reason for delayed projects.

The results of the study show that although project leadership is an essential element in timely project delivery the people charged with that responsibility have not shown the required level of performance that could steer project delivery to best practice. The performance of public construction projects had a negative relationship with project planning. These results imply that performance of public construction projects may be low despite there being a very good project plan. Project planning should be more inclusive to involve all the stakeholders and especially the community members who are the prime users of the projects in question.

Close monitoring of the project progress could therefore improve the schedule performance of the project. It is therefore of essence that project monitoring is streamlined in accordance with the needs of the projects to ensure timely and successful completion of projects.

V. Recommendations

Researcher has identified the following recommendations;

- The government should ensure adequate resource allocation for all the projects it is undertaking
- Further the government should come up with corrective initiatives and ensure that corruption remains to its bare minimum.
- The government should come up with itemized budgets which would require the treasury to send money in respect to that as opposed to present where all the chunk of money comes and the executive is left with the responsibility of allocating it (money should come after planning and not vice versa).
- The government should form agencies to deal with project implementation with responsibilities. These agencies will ensure that there is professionalism in project implementation and reduce political interference
- The government of Rwanda and its agencies should ensure that project planning is above board
- The government of Rwanda and its agencies should also ensure that project monitoring is streamlined in accordance with the needs of the projects to ensure timely and successful completion.

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