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Abstract

Projects are always prone to uncertainties and risks and failure to effectively manage the associated risks appropriately results to failure of the projects in terms of delay in completion (Jean, 2015). Globally, regionally and locally various studies have been conducted on the risk management practices on performance and success of projects. The specific objective of the study are to examine the effect of risk identification on success of Workers Affordable properties Ltd, to determine the effect of project analysis on success of Workers Affordable properties Ltd, to investigate how project risk response planning affects success of Workers Affordable properties Ltd and to evaluate how Project risk monitoring and control affects the success of Workers Affordable properties Ltd. This research adopted descriptive and correlative study design where descriptive statistics was applied to analyze data from questionnaires and interview guides. The collected data was collected through primary data comes which data was composed of information got from questionnaires and interviews held with selected respondents while the secondary data of this research was extracted from different text books, and other previous research documents in the same field. The results revealed the effect of risk management on the success of Workers Affordable properties Ltd. The results evaluated by R-squared and modified R-squared, show that risk management for 75.0% of the total success variation. The coefficient for Risk Identification" is $\beta=0.398$, $t=7.335$, $p<0.05$. These statistics indicate that risk identification significantly and positively affects the success of Workers Affordable Properties Ltd. Regarding Project Analysis, the coefficient is $\beta=0.409$, $t=5.964$, $p<0.05$, For Project Risk Response Planning," the coefficient is $\beta=0.441$, $t=3.496$, $p<0.05$. These statistics indicate that project risk response planning has a statistically significant positive effect on the company's success. Finally, Project Risk Monitoring and Control" has a coefficient of $\beta=0.340$, $t=2.670$, $p<0.05$. These results indicates that project risk monitoring and control significantly and positively affect the success of Workers Affordable Properties Ltd. The study recommends more stakeholder engagement in project risk management to ensure more productive identification of project risks. The study established that the analysis tools utilized were only moderately effective and viable in risk analysis.

Key words: *Risk, Management & Success*

1. Introduction

Projects are always prone to uncertainties and risks and failure to effectively manage the associated risks appropriately results to failure of the projects in terms of delay in completion (Jean, 2015). Globally, regionally and locally various studies have been conducted on the risk management practices on performance and success of projects. For instance, Carvalho and Rabechini (2015) investigated the impact of project risk management practices on success of IT projects findings of the study revealed that IT projects carry out risk management to maximize the performance and to manage risk effectively and efficiently enjoy financial savings and greater productivity. This research assessed the influence of risk management practices of construction projects in Workers Affordable Properties Ltd findings of the study revealed that risk management practices has a positive correlation with project success. When used consistently, risk management practices increase the chances of project success.

Success in construction project is indicated by its performance in the achievement of project time, cost, quality, safety and environmental sustainability objectives (Zhou, & Wang, 2007). Despite the efforts by all players in the construction industry, many construction projects in Rwanda and generally in the region and the world run a high risk poor performance by being well over budget and significantly late. The construction industry generally has poor cost and schedule performance. The industry has a reputation for time and cost overruns. One of the reasons of the bad performance is that the construction industry is one of riskiest of all business types (Clough & Sears, 2005). While some degree of poor cost and time schedule performance is inevitable in construction projects, it is possible to improve risk management strategies to minimize their negative impact and thus improve the project performance. This study aims at determining the effects of risk management practices at the planning stage to the construction project performance. There is a contextual gap since very few studies have been done on the influence of risk management practices on performance of projects in Rwanda. However, the application of the findings of the mentioned studies is limited. It is in this perspective that this research determines the effect of risk management on success of Workers Affordable Properties Ltd.

Objectives of the study

The general objective is to determine the effect of risk management on success of Workers Affordable Properties Ltd.

The specific objectives are:

- i. To examine the effect of risk identification on success of Workers Affordable properties Ltd
- ii. To determine the effect of project analysis on success of Workers Affordable properties Ltd
- iii. To investigate how project risk response planning affects success of Workers Affordable properties Ltd
- iv. To evaluate how Project risk monitoring and control affects the success of Workers Affordable properties Ltd

Hypothesis:

H₀ 1: There is no effect of risk identification on success of Workers Affordable properties Ltd

H₀ 2: There is no effect of project analysis on success of Workers Affordable properties Ltd?

H₀ 3: There is no effect of project risk response planning on success of Workers Affordable properties Ltd

H₀ 4: There is no effect of Project risk monitoring and control on success of Workers Affordable properties Ltd

2. Literature review

This chapter is detailed with the review of the available literature related to the topic of the study named as the risk management and success of construction companies.

2.1. Theoretical Review

Initiated by Freeman (1994) stakeholder theory (2015). The concept's primary emphasis was on how the ripple effect may benefit the company's stakeholders. The basic goal of this idea is to encourage the growth of moral and value-based skills among project managers. This phase involves the identification of influential members of the local community who have a vested interest in the company's success. The idea was developed by Igor Ansoff and Robert Steward of Lockheed Company's planning division. Jones and Wicks both approached this paradigm from their own unique vantage point (1999). The idea of normative stakeholders was dissected by him. This is the original spark that ignited the conflict. If we accept his description, the model shows how the manager and shareholders establish ethical standards for the business. Another school of thought, known as the "unique partner hypothesis," places an emphasis on the pragmatic aspects of partnerships and leadership. The management team's main concern was how the partners were treated.

Agency Theory

Agency theory originates from the paper of Berle and Means (2012) on the separation between ownership and control in large corporations. According to Jensen and Meckling (1976), the firm can be viewed as a nexus or network of contracts, implicit and explicit, among various parties or stakeholders, such as shareholders, bondholders, employees, and society at large. In modern corporations the shareholders (principals) are widely dispersed and they are not normally involved in the day to day operations and management of their companies rather they hire managers (agent) to manage the corporation on behalf of them (Habbash, 2010). The separation of ownership from management provides the context for the functioning of the agency theory.

In the agency theory, the interests of stakeholders are not always aligned. Agency problems occur when the interests of agents are not aligned with those of principals. Depending on the parties involved in conflicts, agency problems can be categorized as: managerial agency or managerialism (between stockholders and management); debt agency (between stockholders and bondholders); social agency (between private and public sectors); and political agency (between agents of the public sector and the rest of society or taxpayers). The agency theory is about management risk and is therefore beneficial to this study.

Portfolio Theory

This hypothesis was proposed by Markowitz (2011). Two important ideas serve as the cornerstone of this method. The initial concept was that no matter what level of risk his company takes, every investor wants to maximize their return. The second premise is that spreading risk across a variety of assets may be beneficial. This model implies that investors chose the safest possible portfolio in order to maximize profits. As a result, investors may only contribute capital to high-risk businesses if they can also expect a high return. To make this notion work, it is necessary to suppose that there exist unsystematic and systematic types of risks. Thus, to change their portfolio, an investor must first add additional stocks to it.

The author of the modern portfolio theory is Harry Markowitz who introduced the analysis of the portfolios of investments in his article “Portfolio Selection” published in the Journal of Finance. The new approach presented in this article included portfolio formation by considering the expected rate of return and risk of individual stocks and, crucially, their interrelationship as measured by correlation.

Prior to this investors would examine investments individually, build up portfolios of attractive stocks, and not consider how they related to each other. Markowitz showed how it might be possible to better of these simplistic portfolios by taking into account the correlation between the returns on these stocks

The diversification plays a very important role in the modern portfolio theory. Markowitz approach is viewed as a single period approach: at the beginning of the period the investor must make a decision in what particular securities to invest and hold these securities until the end of the period. Because a portfolio is a collection of securities, this decision is equivalent to selecting an optimal portfolio from a set of possible portfolios.

2.2. Empirical review

In USA, Project performance is determined by factors such as cost, customer satisfaction, time, health, client changes and business performance safety (Musyoka, 2012). The Concept of delays and overrun cost in projects is now a global phenomenon. According to a report of USA standish group (CHAOS report 2009) only 32% of projects meet the successful expected delivery period. 44% are challenged due to budget constraints and 24% projected with failure and cancellation Africa failure of projects be it NGO, Governmental or Religious based sponsored generates a cycle of rising expectation and unfulfilled promises.

The failure of such project teams to meet the desired project goals is usually as a result of failure to manage risk associated with the projects. According to Carbone and Tippet 2015, managing of project risk is important in successful management of projects.

Okumu and Wanjira (2017) investigated the risk management strategies adopted by Insurance firms in USA. The study adopted a descriptive research design and a total of 18 motor insurance companies consisted of the study population. A simple random sampling and purposive sampling was employed and a total of 54 employees and management of the motor insurance companies were interviewed. The study employed self-administered questionnaires for data collection. Data collected was then analyzed statistically using descriptive statistics and content analysis. The findings of the study implicated that risk control strategies such as identifying risk events, quantifying risk, responding to risk as defined in risk management plan, risk control meetings, use of quality assurance, signed contracts, and use of contingency positively influenced performance of the motor insurance companies.

In Africa, Ubani and Okogbuo (2015) conducted a study in Nigeria to investigate the influence of risk management practices on construction industry. The study adopted a case study research design and the study’ target population consisted of contractors, clients and consultants in the construction industry. A total of 84 respondents represented the sampling size. For data collection the study adopted use of questionnaires that were administered to 15 construction companies. Data collected was then analyzed using SPSS and the findings of the study revealed that the construction firms adopted risk control strategies through identification of the risk, quantifying and responding to the risk in accordance to risk management policy of each firm. The findings of the study further implicated that all of the construction firms adjusted plans and scope of work in order to counter risk effects, monitoring risk making timely decisions and keeping project managers informed about possible risk. The study concluded that by adopting risk control measures the construction company’s performance of

projects is enhanced through working within the time limit and budget of projects.

In Kenya, Wabomba (2015) conducted a study in Nairobi Kenya to investigate the influence of risk management strategies on performance of projects among International Development Organizations.

The study adopted a correlational predictive research design and data was collected using both documentary study review analysis of concepts used by literature and primary methods. Questionnaires were then administered to project and programme managers involved in managing of International Development projects. Data collected was then analyzed using Excel 2013 and findings of the study revealed that the organization adopted changing of work plans to avoid risks, contingency, regular inspections, operational reviews training and skill enhancements in order to prevent risks.

Humphreys, G. and McIvor (2016) conducted a study to investigate the influence of risk prevention on performance and success of supply chain integration study adopted a descriptive research design and a total of 12 firms dealing with supply of stationery were the study' target population. Questionnaires were then successfully administered to the study respondents who consisted of managers, finance offices and procurement officers. Data collected was then statistically analyzed using descriptive and inferential statistics. Findings of the study revealed that the supply chain firms adopted risk prevention strategies such as detailed planning, alternative approaches and contingency as a way of risk prevention. Study findings further implicated that risk prevention practice positively influences the performance of supply chain firms.

In Rwanda, Aimable and Oduor (2015) conducted a study in Rwanda to investigate the effects of risk management strategies on the performance of construction projects. The study adopted a descriptive research design and a total of 291 project team located in 4 districts were the study' population. The study used simple random sampling and the sample size was 169. Study employed structured questionnaires, documentary review and In-depth interviews for data collection and for data analysis the study adopted qualitative analysis techniques. Findings of the study revealed that detailed work plan, safety inspection and having a safety system influence the performance of the construction projects. The study concluded that research prevention strategy influenced the performance of the construction firms.

3. Research methodology

This chapter discusses the research methodology that was used, in an attempt to achieve the objectives of the study.

3.1 Research design

Grinnell and William (1990) define research design as a conceptual structure within which research is conducted. It is a plan for collecting and utilizing data so as to obtain the desired information. This research adopted descriptive and correlative study design where descriptive statistics was applied to analyze data from questionnaires and interview guides.

3.2. Target Population

Grinnell and Williams (1990) defined a population as the totality of persons or objects with which a study concerned. In this study the population was comprised by 200 employees of Risk Management Department, Finance and Accounting Department, M&E department, Procurement department of Workers Affordable Properties Ltd.

3.3. Sample size determination

A sample can further be defined as all the people or classes selected to take part in the research, Due to the nature of the research without also forgetting time, money and size of the institution as the major limitation of the assignment, Sample is a subset, or same part of larger population. The researchers considered all 200 employees of Workers Affordable properties Ltd.

The combination of simple random and purposive sampling techniques used at different points in time to obtain a sample size of 200 members of Workers Affordable properties Ltd. The populations stratify based on the activities, from the stratified from 4 main stratas. Selection was done under purposive sampling technique to ensure that key informants included in the sample.

3.4. Data Collection Tools and Instruments

A Technique is defined as a pretested of questionnaires and interview and desk review that a researcher uses to collect data and information. The data collection techniques include the means used to obtain the desired information about the research topic.

Observation technique

It is also technique was used by researcher in order to collect data and to get more information through the critical observation in Workers Affordable properties Ltd in their daily services. Where a researcher observed the different activities of Workers Affordable Properties Ltd by observing the how risk management contribute to success of construction companies.

Interview technique

This technique was used to interview the staff of Workers Affordable properties Ltd with verbal communication process in order to collect information related to the set objective which constitutes the finality of research.

Documentary technique

This includes the analysis of documents and different records pertaining to the Workers Affordable properties Ltd was used, together with relevant materials from libraries and different websites to find out the literature review in order to accomplish our study.

3.5. Data analysis

Statistical Package for the Social Sciences (SPSS) and Excel was used in processing and analysis of data which informed the presentation of findings, analysis and interpretation. The presentation focused on the research questions. The kind of statistical treatment depends upon the nature of the problem, especially the specific and the nature of data gathered. The researcher was also interested in establishing the risk management on success of construction projects in Rwanda using regression analysis.

4. Research findings

In order to support the goals of the current research, this chapter presents data analysis, interpretation, and presentation of both primary data that have been gathered and secondary data that have been acquired.

Table 1: Correlations matrix

		Success	Risk identification	Project analysis	Project risk response planning	Project risk monitoring and control
Success	Pearson Correlation	1	.788**	.811**	.744**	.736**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	200	200	200	200	200
Risk identification	Pearson Correlation	.788**	1	.722**	.686**	.670**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	200	200	200	200	200
Project analysis	Pearson Correlation	.811**	.722**	1	.813**	.802**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	200	200	200	200	200
Project risk response planning	Pearson Correlation	.744**	.686**	.813**	1	.927**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	200	200	200	200	200
Project risk monitoring and control	Pearson Correlation	.736**	.670**	.802**	.927**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	200	200	200	200	200

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

Source: Author’s computation of primary data (2023) using IBM SPSS Statistics 22

The correlation matrix Table 1 used to describe the relationships between various factors related to project success and risk management in the context of Workers Affordable Properties Ltd. The Pearson correlation coefficient between Risk Identification and Success is strong, with a coefficient of .788, which is highly significant at the 0.05 level. This indicates a strong positive relationship between the effectiveness of risk identification and the overall success of Workers Affordable Properties Ltd's projects.

The Pearson correlation coefficient between Project Analysis and Success is also strong, with a coefficient of .811, highly significant at the 0.05 level. This indicates a significant positive association between thorough project analysis and project success for the company. The correlation between Project Risk Response Planning and Success is .744, which is highly significant at the 0.05 level. This signifies a strong positive correlation between effective risk response planning and project success. The Pearson correlation between Project Risk Monitoring and Control and Success is notably high at .736, highly significant at the 0.05 level. This highlights a strong positive relationship between strong project risk monitoring and control practices and the success of Workers Affordable Properties Ltd's projects.

The correlation results suggest that risk identification, comprehensive project analysis, project risk response planning, and project risk monitoring and control are all positively linked to the success of Workers Affordable Properties Ltd's projects.

Table 2: Module Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.866 ^a	.750	.745	.34550

a. Predictors: (Constant), Project risk monitoring and control, Risk identification, Project analysis, Project risk response planning

Source: Author's computation of primary data (2023) using IBM SPSS Statistics 22

The results in Table 2 show the effect of risk management on the success of Workers Affordable properties Ltd. The results evaluated by R-squared and modified R-squared, show that risk management for 75.0% of the total success variation.

The findings align with the study by Miller (2012) that risk management is a specialized discipline intended to provide decision makers with scientific method to create the desired variation from an expected outcome at some time. It is a transmission and control mechanism, which encapsulates different approaches of how firms choose between the risk-return profiles of alternative (investment) strategies to maximize shareholder value. This is highlighting the effectiveness of risk management on the success of organization as whole and align well with the findings in table 2 showing the positive correlation between risk management and the success of Workers Affordable properties Ltd.

Table 3: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69.827	4	17.457	146.245	.000 ^b
	Residual	23.277	195	.119		
	Total	93.104	199			

a. Dependent Variable: Success

b. Predictors: (Constant), Project risk monitoring and control, Risk identification, Project analysis, Project risk response planning

The statistical significance of the variables is 0.000, according to the results in Table 3. The P-value is less than 0.05, indicating that the model is adequate for the data. As a result, it seems that risk management has a Positive link with the success of construction project in Workers Affordable properties Ltd.

The study by Huessien *et al.* (2007), Risk management commonly perceived does not mean minimizing risk rather the goal of risk management is to optimize risk reward trade-off notwithstanding the fact that banks are in the business of taking risk, supported the findings in table 3 showing how taking risk and manage it well significantly affect the success of Workers Affordable properties Ltd.

Table 4: Multivariate regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.253	.139		1.812	.072
Risk identification	.398	.054	.392	7.335	.000
Project analysis	.409	.069	.406	5.964	.000
1 Project risk response planning	.441	.126	.435	3.496	.001
Project risk monitoring and control	.340	.127	.333	2.670	.008

a. Dependent Variable: Success

Source: Author's computation of primary data (2023) using IBM SPSS Statistics 22

The table 4 provided presents the results of a multivariate regression analysis aimed at assessing the impact of various factors on the success of Workers Affordable Properties Ltd, a construction company in Rwanda. Starting with the constant (intercept) term, it stands at 0.253. This constant represents the estimated level of success when all the independent variables are set to zero, essentially indicating the baseline success of the company without any influence from the examined factors.

Moving on to the independent variables, the coefficient for "Risk Identification" is 0.398. Importantly, the corresponding p-value is 0.000. These statistics indicate that risk identification significantly and positively affects the success of Workers Affordable Properties Ltd. In practical terms, a one-unit increase in risk identification is linked to an estimated 0.398-unit increase in the company's success, and this effect is statistically significant.

Regarding "Project Analysis," the coefficient is 0.409, and its p-value is 0.000. While the coefficient indicates a positive influence that a one-unit increase in risk analysis is linked to an estimated 0.409-unit increase in the company's success, the p-value is below the typical significance threshold of 0.05.

For "Project Risk Response Planning," the coefficient is 0.441, with a p-value of 0.001. These statistics indicate that project risk response planning has a statistically significant positive impact on the company's success. A one-unit increase in this factor is associated with an estimated 0.441-unit increase in success.

Finally, "Project Risk Monitoring and Control" has a coefficient of 0.340 and p-value of 0.008. These results indicates that project risk monitoring and control significantly and positively affect the success of Workers Affordable Properties Ltd, with a one-unit increase leading to an estimated 0.340 -unit increase in success.

5. Conclusion

The study guided by those hypothesis, H0 1: There is no effect of risk identification on success of Workers Affordable properties Ltd. H0 2: There is no influence of project analysis on success of Workers Affordable properties Ltd. H0 3: There is no effect of project risk response planning on success of Workers Affordable properties Ltd. H0 4: There is no effect of Project risk monitoring and control on success of Workers Affordable properties Ltd.

The statistical significance of the variables, with p-values below 0.05, confirms the adequacy of the model for the data. Specifically, risk identification, project risk response planning, and project risk monitoring and control all exhibit statistically significant positive associations with project success. These findings emphasize the critical role of effective risk management practices in achieving successful construction projects for Workers Affordable Properties Ltd. The one exception is "Project Analysis," where while there is a positive influence, the p-value suggests room for improvement in establishing its significance in the context of project success. Therefore, hypothesis testing rejected all H01, H02, H03 and H04 based on significance level while rejecting all of the four-hypothesis based on correlation or relationship coefficients.

6. Recommendations

Recommendation Based on the research results, the following recommendations can be offered:

The study recommended training of staff at all levels on different aspects of project risk management to further improve the implementation framework in order to ensure time (schedule), scope (quality) and cost (budget) compliance of construction project.

On project risk identification, the study recommends more stakeholder engagement in project risk management to ensure more productive identification of project risks.

Regarding project risk analysis, the study established that the analysis tools utilized were only moderately effective and viable in risk analysis. As such, the project management team should explore ways for enhancing the effectiveness of the tools in risk analysis by providing more orientation of stakeholders on this area.

On project risk response planning, the study recommends involvement of all stakeholders with interest in Construction project and adoption of a wide range of responses to risks with emphasis on risk prevention. Finally, on project risk monitoring and control, the study recommends that risk be monitored and controlled more frequently to ensure success of Construction project.

The management of Construction project should keep up the project risk analysis protocols that are in place and try to improve by providing an effective linkage between the project risk identification process and the analysis since the latter is a natural progression from the former. It should also consider the use of more quantitative risk analysis tools such as critical path scheduling or cost estimating to boost the project risk analysis effort even further.

The management of Construction project should continue improving its risk control measures given the dynamic nature of risks especially in health sector. It should also invest even more resources in monitoring and evaluation systems to enhance its level of preparedness.

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