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Stakeholder-Centric Analysis for Enhancing Private Sector Building Project Performance in Kampala, Uganda

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Abstract
In the context of Central Division, Kampala, Uganda, this study delves into the prevalent overruns across diverse sectors of building projects while unraveling the challenges faced by project participants, including owners and professionals. Proposing innovative solutions, the research focuses on a stakeholder-centric analysis of project delays and cost overruns with the ambitious goal of crafting a predictive model for unparalleled project management effectiveness. Data were meticulously gathered through thoughtfully designed questionnaires, distributed among building project professionals, and supplemented with project-related information. The findings illuminate an average time overrun of 20%, showcasing the highest spike in residential projects at 57.8% and the lowest ebb in hospitality and institutional projects at 4.8%. The study underscores the critical importance of scrutinizing project plans for regulatory compliance while astutely pinpointing primary causes for overruns. Employing SPSS, the study developed a time overrun prediction model, attributing delays to nuanced factors like cash flow (21.2%), construction-related issues (0.187%), cost and scope estimation (18%), project nature (17.5%), and environmental nuances (15.6%). This meticulously crafted model, unveiling causes and their impacts, emerges as a tool for project managers and stakeholders, empowering them to foresee potential delays early and proactively implement targeted measures for project success.

1.0 Introduction

Infrastructure development is a critical driver of economic growth in developing countries (World Bank, 2019). It directly influences various economic aspects, including GDP growth, productivity, and the investment climate (Economic Commission for Africa, 2014). This is especially pertinent in the case of Uganda, where studies, such as the one conducted by Mawejje et al. in 2017, have revealed that the infrastructure deficit has been a significant hindrance to the country's economic growth.

Uganda currently faces a pressing challenge concerning overruns in its ongoing building projects, particularly in the capital city of Kampala. Specifically, both cost and time overruns have been exacerbated by the rising demand for commercial spaces like apartments and condominiums (Ampaire et al., 2020). Additionally, Uganda has set ambitious goals under its Vision 2040, encompassing sectors such as oil and renewable energy. These ventures introduce unprecedented complexity compared to traditional projects, further compounding the challenges of infrastructure development, as highlighted by the Government of Uganda in 2020.

Extensive global evidence indicates that delays and increased costs are common issues in the building industry, affecting more than half of all projects worldwide (Flyvbjerg et al., 2003). The challenges related to cost control become more evident as projects grow in scale and complexity, as demonstrated by Love et al.'s (2018). Various factors, including strict quality standards, compressed construction schedules, involvement of multiple stakeholders, and specialized work, contribute to this complexity, as identified by Flyvbjerg et al. (2003). In pursuit of Uganda's ambition to achieve middle-income status by 2040, the government has outlined a strategy to increase funding for infrastructure development including building projects. However, with limitations on traditional financing options and the participation of funders like China on more commercial terms, it becomes essential to implement practical measures to effectively address cost overruns in prominent projects, as reported by the Ministry of Finance, Planning, and Economic Development in 2015. The success of a project is undeniably linked to its ability to stay within the original budget, adhere to specified timelines, and meet the quality standards outlined in contract documents, which is a crucial aspect of project success, as emphasized by AACE International (2006).

This study aimed to explore the various factors contributing to both cost and time overruns in Uganda's building projects and seeks to offer strategies to ensure the successful completion of these projects, in alignment with the nation's economic development objectives. It examined issues such as inadequate project planning, insufficient risk management, procurement challenges, and stakeholder management within the context of Uganda's building projects, with the goal of providing actionable recommendations for improvement.

2.0 Materials and Methods

2.1 Study Area

Central Division, Kampala, lies at the very heart of Uganda's capital city, Kampala with a huge number of construction projects taking place. This division envelops the central and downtown areas of Kampala, constituting a mosaic of diverse neighborhoods, bustling commercial districts, iconic cultural landmarks, and vital administrative centers. Its boundaries stretch from the northernmost tip of Nakasero Hill to the southernmost shoreline along the picturesque Lake Victoria. Furthermore, it extends from the western border, delineated by Nakivubo Channel, to the easternmost boundary. This expansive area encompasses significant locales such as Nakasero, Kololo, Nakivubo, and the dynamic business hub along Kampala Road.

2.2 Research Design

The study adopted a quantitative research design. Quantitative methods were primarily employed for data collection and subsequent rigorous analysis, involving inferential and experimental techniques (Smith et al., 2017). These quantitative approaches allowed the study to obtain precise, quantifiable insights into the factors influencing cost and time overruns in construction projects.

2.3 Target Population and Sample Size

The preliminary survey and consultations with the regulating authority (KCCA) identified a total of 102 projects, considering only those from 2018 onwards, including both completed and ongoing projects. Applying Equation (1), the study established a sample size of 83 projects to participate in the research as presented in Table 1.

$$\mathbf{n} = \frac{N}{(1 + Ne^2)} \qquad \textbf{(1)}$$

Where**;**

N means the total population
e means the error
n is the sample space

In addition, another separate survey established an average of five (5) highly active stakeholders that were randomly selected to participate the study. These included project managers, architects, quantity surveyors, consultants, and Clerks of works as presented in table 2.1.

Table 2.1: Sample size and its distribution across all the identified stakeholders

Participant Category	***Sample Size***
Project Managers	83
Consultants	83
Architects	83
Quantity Surveyors	83
Clerks of works	83
Total	**415**

2.4 Data Collection

Following extensive literature survey of the causes of cost overruns in construction projects, study initially identified 30 potential causes of cost and time overruns in building construction projects as detailed in table 2A (Appendix). Subsequently, these causes were

categorized into related groups and further subdivided into five specific clusters: cost and scope estimation, construction related, nature of the project, environmental aspects, and cash flows.

2.5. Internal Consistency of the Questionnaire

Table 2.2 presents the outcomes of our pilot test to measure the internal consistency of the questionnaire. The results demonstrated strong internal consistency across various causes as a 0.864 achieved a Cronbach's reliability alpha achieved is way higher than 0.7 as recommended by Wong & Cheung (2005) meaning that the tool was okay for adoption.

Table 2.2: Cronbach's Alpha test Results

Causes time and cost overrun	Cronbach's alpha
Cost and scope estimation	0.879
Construction related	0.872
Nature of the project	0.845
Environmental aspects	0.880
Cash flow	0.846
Average	0.864

2.6 Questionnaire Response Rate

Initially, a total of 415 questionnaire sets were intended to be distributed as shown in Table 2.3. However, due to many factors, 357 were filled and returned/picked resulting into an average response rate of 86%.

Table 2.3: Questionnaire Response

Participant	*No. Distributed*	*No. Filled, Picked/Returned*	*Response Rate (%)*
Project Managers	83	53	64
Consultant	83	67	81
Architects	83	75	90
Quantity Surveyors	83	79	95
Clerks of works	83	83	100
Total	**415**	**357**	**Av: 86%**

2.7 Variety of Building types Studied

As depicted in figure 2.1, the majority of the examined projects, accounting for 58%, were residential or apartments. Retail shops constituted 18%, while others represented 15%. Institutions and hospitality projects both comprised 5% each of the total projects studied.

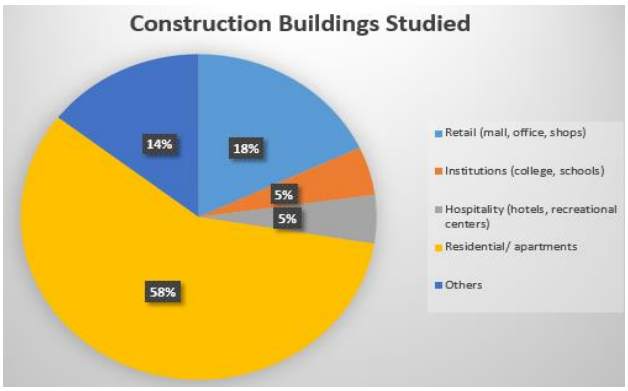

Figure 2.1: Buildings Projects Studied

2.8 Percentage of Time Overruns for different building project types studied

The results for the distribution are as presented in the figure 2.2. The average time overrun was found to be 19.98% with the highest found in residential/apartments at 48% and the lowest in Institutions (college, schools) at 5%.

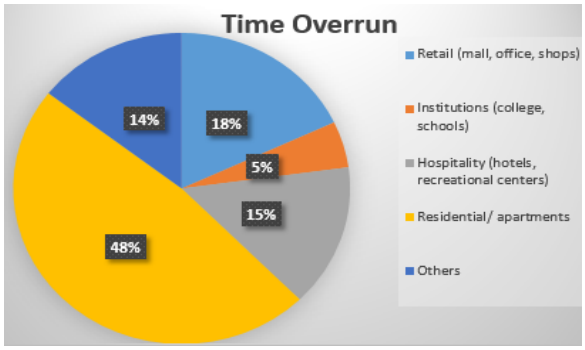

Figure 2.2: Time Overrun

2.9 Percentage of Cost Overruns for different building project types studied

The average cost overrun was found to be 33.1% with highest established cost overrun was established to be in Retail (mall, office, shops) at 41% while the lowest in others that were not categorized in the study such as warehouses as shown in figure 2.3.

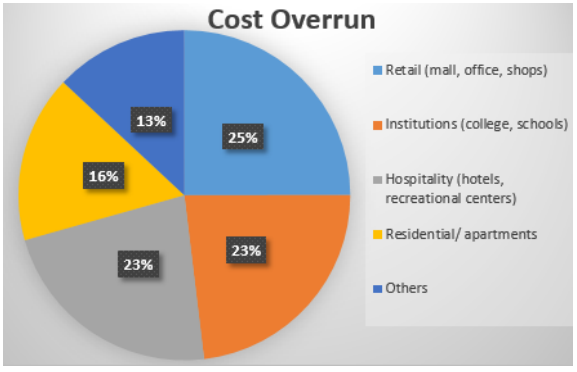

Figure 2.3: Cost Overrun

3.0 Analysis of the Causes of building project Time and Cost Overruns

The findings underscore that cash flow related issues are the major cause of time and cost overruns, followed by construction related issues, Cost and Scope Estimation, Nature of the Projects and Environmental Aspects issues are least to cause these overruns (Apolot et al., 2012). These means that leading causes of building project overruns are manmade and therefore could be avoidable.

Table.3.1: Analysis of the Causes (From Project Participants' Perspective)

Identified Cause Category	PM	Arch	Consultants	QS	CoW	FI	Rank
Cash Flow	19	29	16	25	17	0.297	1
Construction Related	15	18	20	17	22	0.258	2
Cost and Scope Estimation	08	12	16	20	25	0.227	3
Nature of the Projects	03	11	06	11	13	0.123	4
Environmental Aspects	08	05	09	06	06	0.095	5
Total	**53**	**75**	**67**	**79**	**83**	**1.00**	

3.1 Time Overrun Model Summary

The analysis of the data yielded the model defined as: $Y = 0.09 + 0.212X_1 + 0.187X_2 + 0.180X_3 + 0.175X_4 + 0.156X_5$ as detailed in table 3.1.

Table 3. 1: Regression model Summary

Model	Standardized Coefficients	Significance
Error	0.090	0.000
Cash Flow (X_1)	0.212	0.000
Construction Related (X_2)	0.187	0.000
Cost and Scope Estimation (X_3)	0.180	0.000
Nature of the Projects (X_4)	0.175	0.000
Environmental Aspects (X_5)	0.156	0.000

The model result showed that all the dependent variables are positively correlated with the time performance on the building projects. Conducting the

regression analysis at a 5% significance level reveals statistical significance, as evidenced by all p-values being less than 0.025 (Sig. $p < 0.025$) in the two-tailed test. Furthermore, the results demonstrate that time performance is attributed to 21.2% are cash flow causes, a 18.7% construction related causes, 18.0% cost and scope related causes, and 17.5% are due to the nature of the project i.e., complexity, Design and build, and lastly 15.6 % are due to environmental aspects such as rain.

4.0 Conclusions

The findings revealed significant concerns among consultants, contractors, and clients regarding the likelihood of projects being finished within the stipulated contract period and staying within budget. Furthermore, analyzing data relating to scheduled completion dates, milestones for activities and actual completion dates from contract documents of the building projects were analyzed. The average value of time overrun was found to be about 20%. The highest time overrun found in residential/apartments at 57.8% and the lowest of 4.8% each in hospitality (hotels, recreational centers), and Institutions (college, schools). Analysis of how private building projects adhered to their contract costs in Kampala shows varying percentages depending on building project type with an average of 33.1%, highest observed in Retail buildings (mall, office, shops) at 41.3%.

The findings also revealed that the most causes of time and cost overruns in building construction are in the order of cash flow causes, construction related, cost and scope estimation, nature of projects and environmental aspects.

Based on the identified causes and after determining their influences on time, a time overrun prediction model was established. The model highlights that the time overrun could be attributed to 21.2% are cash flow causes, a 0.187% construction related causes, 18% cost and scope related causes, and 17.5% are due to the nature of the project i.e., complexity, design and build, and lastly 15.6 % are due to environmental aspects such as rain.

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Declaration of conflict of interest

I want to affirm that, to the best of my knowledge, the research and findings presented in the thesis and

consequently this publication have been conducted objectively and without bias. In cases where conflicts of interest are identified, steps have been taken to address and manage these conflicts appropriately.

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APPENDIX

Tablee 2A: A summary and Analysis of the 30 identified causes of overruns

Causes	*PM*		*CoW*		*Consultant*		*QS*		*Contractor*	
	FI	**II**	**FI**	**II**	**FI**	**II**	**FI**	**II**	**FI**	**II**
Disputes on site	0.68	0.69	0.57	0.06	0.70	0.45	0.55	0.8	0.08	0.20
Lack of coordination between construction parties	0.66	0.53	0.40	0.68	0.69	0.57	0.06	0.33	0.63	0.43
Poor financial control on site	0.68	0.69	0.54	0.06	0.65	0.68	0.69	0.57	0.06	0.68
Poor planning	0.40	0.68	0.69	0.58	0.06	0.40	0.57	0.06	0.53	0.40
Previous experience of contract	0.68	0.69	0.57	0.16	0.40	0.57	0.06	0.69	0.57	0.06
Relationship between managers and labors	0.69	0.57	0.06	0.33	0.63	0.06	0.65	0.68	0.69	0.06
Information coordination between owner and project parties	0.40	0.63	0.71	0.40	0.68	0.67	0.51	0.26	0.37	0.40
Leadership skills for project manager	0.62	0.69	0.57	0.81	0.65	0.68	0.69	0.57	0.66	0.65
Speed and reliability of service to owner	0.61	0.49	0.57	0.19	0.40	0.51	0.06	0.69	0.57	0.21
Number of disputes between owner and project parties	0.58	0.39	0.57	0.70	0.07	0.45	0.55	0.8	0.08	0.20
Number of rework incidents	0.66	0.53	0.40	0.68	0.69	0.57	0.06	0.33	0.63	0.43
Currency exchange	0.68	0.69	0.54	0.06	0.65	0.68	0.69	0.57	0.06	0.68
inflationary pressure	0.40	0.68	0.69	0.58	0.06	0.40	0.57	0.06	0.53	0.40
Project financing	0.68	0.69	0.57	0.16	0.40	0.57	0.06	0.69	0.57	0.06
Market share of organization	0.66	0.53	0.40	0.68	0.69	0.57	0.06	0.33	0.63	0.43
Liquidity of organization	0.68	0.69	0.54	0.06	0.65	0.68	0.69	0.57	0.06	0.68
Cash flow of project	0.40	0.68	0.69	0.58	0.06	0.40	0.57	0.06	0.53	0.40
Profit rate of project	0.62	0.69	0.57	0.81	0.65	0.68	0.69	0.57	0.66	0.65
Overhead percentage of project	0.61	0.49	0.57	0.19	0.40	0.51	0.06	0.69	0.57	0.21
Project design cost	0.58	0.39	0.57	0.70	0.07	0.45	0.55	0.8	0.08	0.20
Material and equipment cost	0.40	0.63	0.71	0.40	0.68	0.67	0.51	0.26	0.37	0.40
Project labour cost	0.62	0.69	0.37	0.81	0.65	0.68	0.69	0.57	0.66	0.65
Cost of rework	0.61	0.49	0.17	0.19	0.40	0.51	0.06	0.69	0.57	0.21
Motivation cost	0.58	0.39	0.37	0.70	0.07	0.45	0.55	0.80	0.08	0.20
Cost of variation orders	0.66	0.53	0.40	0.68	0.69	0.57	0.50	0.33	0.66	0.43
Waste rate of materials	0.61	0.69	0.57	0.06	0.70	0.43	0.55	0.28	0.08	0.20
Regular project budget update	0.66	0.43	0.40	0.68	0.69	0.33	0.06	0.33	0.63	0.43
Cost control system	0.81	0.69	0.54	0.06	0.65	0.68	0.69	0.54	0.06	0.68
Escalation of material prices	0.40	0.68	0.69	0.58	0.06	0.40	0.57	0.06	0.53	0.40
Differentiation of currency prices	0.68	0.19	0.57	0.06	0.70	0.46	0.55	0.71	0.08	0.20