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Demand Side Perception on Success Factors for Implementing Public Road Construction Projects

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Abstract: Cost and schedule overruns, as well as substandard works, are common factors that fail organisations' objectives within the construction industry. Particularly, these factors affect public road construction projects and cost taxpayers. Researchers continue scanning the environment to establish why construction projects are ever behind schedule and over budget with substandard works and contract variations to identify significant factors for successful project implementation. This study expands the debate by looking at demand side perception in establishing success factors for implementing public road construction projects motivated by governments' high expenditure on construction projects without meeting objectives. A cross-sectional research design with a structured self-administered questionnaire was used to obtain views from three public entities representing the demand side. Results were analysed following partial least square structural modelling (PLS-SEM) in Smart-PLS3. The research design enabled statistical tests to be conducted on validity, reliability, normality, multicollinearity, correlations and regression. The PLS algorithm and bootstrapping resampling approach were employed to determine the relationship between variables by estimating path coefficients and significance. Path coefficients helped to determine strength, direction and significance, and examine the variance of dependent variables explained by combined independent variables. Results revealed that the professionalism of the staff, compliance with the public procurement regulatory framework, monitoring activities and contractors' resistance to non-compliance are significant success factors in enhancing public road implementation. Hence, adopting these factors would be a game changer in implementing complex road construction projects. In addition, complex construction projects in a dynamic construction industry require continuous scanning to establish more factors and cope with industry dynamics.

Keywords: Governement project implementation, Public road construction, Success factors, Demand side, Uganda

INTRODUCTION

Cost and schedule overruns are common in the construction industry evidenced by collapsing building and substandard works that are equally faced by public road construction projects (Alinaitwe, Apolot and Tindiwensi, 2013). Construction cost variations, delayed project completions and shoddy works are the cornerstone of project failures catalysed by a lack of commitment and cooperation among construction stakeholders (Ntayi et al., 2010). Interestingly, meeting client

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objectives defines successful construction project implementation (Furneaux et al., 2006) that is tagged on quality, cost-effective and timely completion (Simushi and Wium, 2020; Hussain, Fangwei and Ali, 2019). In Australia, non-compliant construction products affect construction industry performance by 50% causing unsuccessful project implementation (Australasian Procurement and Construction Council, 2013). Furthermore, ineffective regulatory framework and structures are challenging public road construction projects, not complying with completion time and estimated budget. These challenges have led to failed construction projects (White and Fortune, 2002). Such failures continuously the bite public road subsector, challenging government objectives and undermining economic development that relies on road transport that is responsible for 90% of cargo freight and passengers (Ministry of Works and Transport, 2014).

The construction sector accounts for economic growth worldwide by providing infrastructures such as roads, hospitals, schools and other social facilities (Mwelu et al., 2019; Saidu and Shakantu, 2016). For a construction projects to be successful, it must be completed within the scheduled time, budget, and predetermined scope and quality (Hamta, Ehsanifar and Sarikhani, 2021; Luong, Tran and Nguyen, 2021). However, literature shows that by the time a project is completed, the actual cost exceeds the original contract price by about 30% (Akin et al., 2021). The construction industry is challenged by cost, time and scope constrains. Globally, 9 of 10 transport infrastructure projects deviate from the original cost. In Australia, a cost overrun of 12.22% is reported and in Colombia, a report reveals that public infrastructure projects experience 110% cost overruns (Gómez-Cabrera et al., 2020).

The transport sector plays a crucial role in economic development since an efficient transport system enables lower production costs, timely service delivery, access to markets, boosting tourism, and promoting imports and exports. Despite Uganda's road sector underfunding and increasing construction and maintenance costs, the transport and communication subsector contributed 5.3% to the total GDP in 2013/2014 and 5.1% in 2012/2013 and its national budget allocation increased by 17% in 2015/2016 with a known record of taking the lion's share compared to other sectors (Ministry of Works and Transport, 2015; Cornish and Mugova, 2014). This article considers demand-side perception to empirically establish success factors for implementing public road construction projects.

Public road construction project failures surround Uganda's economically dependable subsector. Construction projects are unsuccessful when they fail to meet government goals that are aligned with public expectations, such as quality, cost and timely delivery (Love et al., 2019). Substandard works, cost variations and schedule overruns contribute significantly to the unsuccessful implementation of these projects (Love et al., 2019). In Uganda, the Busega-Masaka (51 kwm) road project lost significant funds (with 52% contract price variations) and completion was delayed by three years (Uganda National Road Authority, 2014). The project was terminated midway, a new contractor was appointed and the case is currently in court and involves top government officials. Further examples of project failures marred with procurement irregularities are Kanoni-Ssembabule-Villa Maria (120 km) and Hima-Katunguru (58 km) road construction projects where UGX322 billion (AUD 122.360 mil) were queried, prompting Ugandan parliament to order an investigation on 28 on-going road construction projects (New Vision, 2016a). These persistent reports surrounding road project implementation failures motivated this research to establish success factors for implementing public road construction

projects based on demand-side perception. For purposes of the study reported in this article, the demand side means the government as the client in need of the road construction projects. Meanwhile, perception refers to the views of staff working with the government agencies who participated in this study. The three public entities include Ministry of Works and Transport, the Uganda Road Fund and the Public Procurement and Disposal of Public Assets Authority.

LITERATURE REVIEW

Project Success

Project success is defined as successful task accomplishment by meeting objectives (Renault, Agumba and Ansary, 2020). In addition, project success is the completion of the project within the estimated time, cost and quality and meeting the client's satisfaction (Kahvandi et al., 2020). Whereas quality, cost and time determines satisfactory contract performance, a construction project is deemed successful if client satisfaction is achieved (Lee, Rahman and Doh, 2021; Hussain et al., 2019). Besides Atkinson's (1999) Iron triangle success indicators, other factors determining construction project success include safety, functionality and satisfaction (Love et al., 2017; Walker and Lloyd-Walker, 2015).

Compliance with public procurement regulatory framework and project success

Public road construction projects are temporary and unique endeavours that should comply with selected performance policies for successful implementation (Zadawa., Hussin and Osmadi, 2018a). For example, complying with contract specifications and the scope of works ensures successful project implementation (Kukoyi et al., 2021; Hussain et al., 2019). However, for compliance to ensure project success, project inspection and audit are crucial (Snyder, 2013). Literature shows that compliance with regulatory framework significantly influences the successful performance of construction projects (Sanga, 2020, Ameyaw et al., 2017). Disappointingly, road construction stakeholders are dissatisfied with project costs and schedule overruns, affecting 30% of roads and bridges implementation performance (Ford, 2011). On average, 48% of infrastructure projects entirely are not completed on time, within estimated cost and expected quality (Love et al., 2018). A lack of compliance is affecting the Australian construction industry (Gambo, Said and Ismail, 2016). Additionally, poor-quality public road construction projects define unsuccessful construction project performance (Marnewick, Erasmus and Nazeer, 2018).

Familiarity with public procurement regulatory framework and project success

Despite the support of institutional theory by DiMaggio and Powell (2015), little is known about the relationship between familiarity and project success, which creates a literature gap this study would fill. Construction projects are complex and they bring together different stakeholders with varying perceptions and attitudes in executing respective project activities (Tayeh et al., 2018). This situation calls for careful planning and control right from the project initiation stage to completion

by defining the project well and recruiting competent staff to implement these projects (Rafique, Ahmed and Ismail, 2021). Staff competence is enabled through training to enhance their familiarity with project requirements (Decarolis et al., 2018). Continuously enabling staff competence through training is equally important for implementing public road construction projects (Zadawa et al., 2018a) because poor training accounts for the flawed construction sector (Othman et al., 2018).

Enabling staff competence ensures accumulated knowledge and expertise in project implementation that creates a competitive advantage and enhances project success (Van Roy and Firdaus, 2020). The public road construction team must thoroughly understand its scope with a clear governing regulatory framework to avoid manipulations. This requirement is important for successful public construction projects (Tutesigensi, Kibwami and Matege, 2021).

Monitoring activities and project success

Most organisations employ monitoring mechanisms to influence staff performance in successful project implementation (North, 2016). For example, regular monitoring of project budgets enables quicker fault tracking and corrective actions that lead to successful implementation (Schapper, Malta and Gilbert, 2006). Successful performance of construction projects also relies on regular monitoring of activities undertaken (Hussein, Yusof and Jaafar, 2020). For example, the successful performance of the United States construction sector is attributed to the effective monitoring and tracking of contractors (Bartle and Korosec, 2003). In China, monitoring underground construction project activities enhanced the successful implementation of these projects (Zhou et al., 2019).

Recent studies emphasise monitoring mechanisms to successfully implement quality construction projects (Moyo, Crafford and Emuze, 2022, Lapidus and Yves, 2018). These mechanisms encourage total supervision and performance monitoring of construction projects, starting with contractors, by reducing risks that are antagonising successful project implementation (Hussain et al., 2019). Furthermore, effective monitoring of irresponsible construction staff ensures the successful implementation of public construction projects (Love et al., 2017). This finding is supported by institutional theory contending that successful organisational performance is glued on monitoring effectiveness (North, 2016). Thus, monitoring the public road implementation team is paramount to avoid undesirable behaviours and encourage successful project delivery, thereby achieving value for money (Van Slyke, 2007).

Professionalism of staff and project success

Professionalism is about competence in skills, special knowledge with experience and being a member of a professional body exhibiting ethical code (Watson, 2002). Ethical codes are vital in controlling staff in the construction industry (Owusu, Chan and Shan, 2017). Professionalism is inevitable for public road construction projects that require staff with competent skills, ethics, experience and knowledge to successfully implement these projects (Hussain et al., 2019). Pheng and Chuan (2006) noted that professional competence is essential for successful performance and it is achieved through training, coaching, mentoring and developing and retaining a competent workforce (Walker and Lloyd-Walker, 2015). This requirement

is vital for implementing public road construction projects since construction industry operators focus on professionalism to realise a free corruption industry (Sohail and Cavill, 2008). Professional experience is vital for a successful construction industry (Zhang and Sunindijo, 2021). Interestingly, a lack of construction expertise affects the quality of construction projects in Australia (Rafferty and Toner, 2018).

Lack of professionalism is a barrier to project success (Um and Kim, 2018) and it is globally challenging for the construction industry. For example, the shortage of skilled, qualified and experienced workforce in South Africa, Jordan, the Gaza Strip and India, among others, affects project success (Tabish and Jha, 2015; Sweis et al., 2014). Equally, Uganda's construction industry is unsuccessful because it is marred by an incompetent workforce lacking the necessary skills in construction due to poor training and recruitment methods (Alinaitwe, Mwakali and Hansson, 2007). Accordingly, expertise and professionals are needed to implement construction projects (Tayeh et al., 2018).

Perceived inefficiency of public procurement regulatory framework and project success

A clear and simple regulatory framework governing complex public road construction projects is inevitable for road subsector players to understand and interpret easily (Kagioglou et al., 2000). This requirement is important because it limits unethical manipulators to drive their ambitions progressively (Shan et al., 2017). An efficient regulatory framework facilitates a timely road implementation process by eliminating frequent consultation with the legal fraternity for interpretation (Mwelu et al., 2019). Such a framework would ensure a clear scope of construction projects, which is important for successful implementation (Tayeh et al., 2018). Convincingly, inefficient public procurement regulatory frameworks affect the successful implementation of procurement project in East Africa (Odhiambo and Kamau, 2003). Further international literature shows that inefficient regulatory frameworks affect construction projects (Bapat, Sarkar and Gujar, 2021), hence requiring a proper regulatory framework to govern the construction industry.

Contractors' resistance to non-compliance and project success

Contractors compete for limited government contracts whereby winning such contracts relies on previous contract performance in terms of timely completion, quality workmanship and being within the contract budget. This compels contractors to resist bad decisions that will undermine contract performance and limit the chances of winning future contracts. Notably, different public road construction stakeholders come to accomplish specific assignments and as they do so, they may have conflicting interests contrary to project success (Wright, Mukherji and Kroll, 2001). Compliance meets resistance from different players with varying ambitions and means of accomplishing project tasks (Babalola et al., 2016), thus requiring coordination among construction participants for project success by reducing risks associated with cost estimation (Hussain et al., 2019). Accordingly, contractors' capability and performance are inevitable for the successful implementation of public construction projects (Hussain et al., 2019).

Sanctions on staff and project success

Sanctions are coercive strategies involving threats and penalties levied on staff working contrary to predetermined targets (Zadawa, Hussin and Osmadi, 2018a). Despite mixed reactions to using sanctions to achieve these targets, they are widely applied to tame deviant staff (Ofori-Kuragu, Owusu-Manu and Ayarkwa, 2016). Applying sanctions in public road construction projects is important given the current wave of procurement irregularities (New Vision, 2016b). Failed construction projects are a consequence of either laxity in enforcing punitive measures or ineffective sanctions that encourage unethical acts among project implementers (Sanda et al., 2022).

Research Model

The model illustrates the relationship between seven independent variables and project success, as depicted in Figure 1. This figure illustrates how the seven independent variables (factors) reviewed in the literature influence the dependent variable (project success).

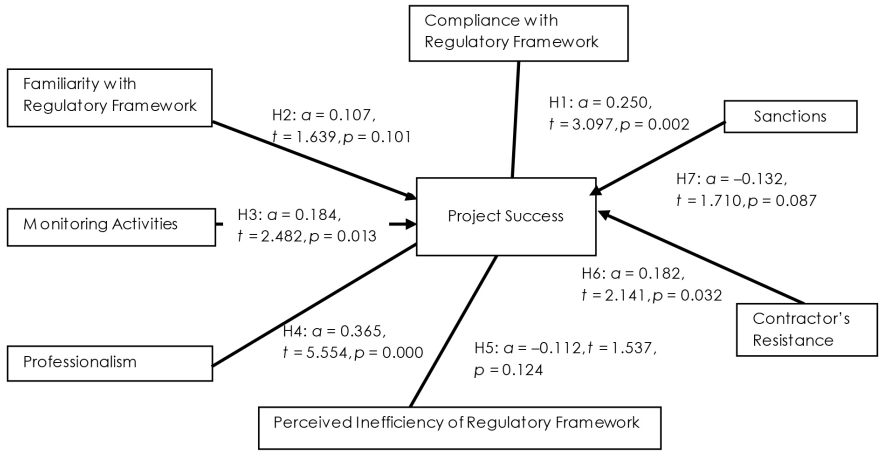

Figure 1. Validated model

METHODOLOGY

A cross-sectional research design based on a questionnaire survey was used since hypotheses needed statistical testing to determine the significance of variable relationships to develop the model and generalise results. This design was chosen because it is more accurate and able to produce valid and reliable results for generalisation (Sekaran and Bougie, 2010). A sample of 157 was selected from 257 respondents from three public entities following (Krejcie and Morgan, 1970). Stratified proportionate random sampling was adopted to determine respondents

from respective entities based on departments and simple random sampling was adopted to select final respondents who were given the questionnaire to complete.

The questionnaire was developed in three steps: generating items, purifying and validating the instrument. These steps were enabled by piloting the questionnaire to procurement officers and construction managers in New South Wales, Australia. Their comments resulted in deletion and rewording of the instrument. The final questionnaire was physically delivered to respective public entities in Uganda through research assistants doubling as employees. Follow-ups were made through telephone reminders and fully completed questionnaires were physically collected, resulting in 154 usable questionnaires representing a 98.1% response rate. The questionnaire was measured on a five-Likert scale ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree". These items were adopted from previous studies with slight modifications to match the current study. A Likert scale is an efficient unidimensional scale that ensures all items measure the same thing (Zadawa, Hussin and Osmadi, 2018b).

Measurement Model Evaluation

The measurement model (outer model) defines the relationship between manifested variables (indicators) and their respective latent variables. The measurement model evaluation was carried out to determine indicator reliability, construct reliability (internal consistency), average variance extracted (AVE) and discriminant validity (Ringle et al., 2018). Indicator reliability ascertains how much of the indicator variance is explained by its variable established through indicator loadings. Strong indicator association was determined through composite reliability that measures the representativeness of indicators to their respective variable. We used PLS-SEM to explore a three-step process in obtaining factor loadings, path coefficients and coefficient of determination (R^2). This step was achieved by running the PLS algorithm and evaluating indicator coefficients. Indicators with coefficients ≥ 0.7 were retained, while indicators with coefficients < 0.5 were dropped. All variables were measured reflectively and dropping indicators with coefficients below 0.5 did not affect construct meaning (Müller, Schuberth and Henseler, 2018).

Measurement Indicators

There are eight variables with various measurement indicators as shown in Table 1.

Table 1. Measurement indicators

Variable	Indicators
Project success	1. Road construction projects are implemented in accordance with specifications. 2. Road construction projects are completed within the schedule. 3. Road construction projects are completed within budget.
Compliance with public procurement regulatory framework	1. Proper authorisation of road construction projects. 2. Timely delivery of road construction projects. 3. Timely recording of road construction transactions.
Familiarity with the public procurement regulatory framework	1. Precisely written regulatory framework governing public road construction projects for easy interpretation. 2. Deploy staff who are familiar with the implementation of public road construction projects. 3. Employing staff with appropriate academic qualifications to work on applicable road construction projects.
Monitoring activities	1. Frequent inspections to check on the timely recording of project progress. 2. Frequent inspections to ensure timely project completion. 3. Frequent inspections to determine proper storage methods to prevent damage to road construction materials.
Professionalism of staff	1. High professional integrity by staff. 2. Professional judgement during decision-making. 3. High level of confidentiality. 4. Practical experience in road construction. 5. Required expertise in road construction.
Sanctions on staff	1. Penalties on those found guilty without any warning. 2. Sanctions are implemented in secret. 3. Sanctions with negative consequences are imposed.
Perceived inefficiency of the public procurement regulatory framework	1. Ban on negotiation between contractors and public officers during road construction. 2. Ban on a contract extension beyond the agreed schedule. 3. Ban on underperforming contractors.
Contractors' resistance to non-compliance	1. Contractors' readiness to take action against bad decisions. 2. Contractors' knowledge of the public road procurement process.

Validity and Reliability

It was clear that over 94% of the respondents possessed a bachelor's degree and above, which implied that the majority of the respondents were academically qualified staff and competent to interpret and answer questions raised, thus increasing the confidence and reliability of the responses obtained. The majority of respondents had professional qualifications and were mainly in the engineering profession. This option was not listed in the questionnaire. Further reliability and validity tests were performed in Smart-PLS3 software by running PLS algorithms with factor analysis to obtain measurement items based on indicator loading. Partial least square structural modelling (PLS-SEM) using Smart-PLS3 was considered because of its wide application, robust techniques in handling non-normal data and simultaneous analysis and production of different results once compared to other statistical software (Sarstedt et al., 2019). Composite reliability determines construct reliability because its parameter estimation is more accurate with close approximation than Cronbach alpha (Müller, Schuberth and Henseler, 2018). Convergent was measured through AVE to ensure indicators' representation in respective constructs to determine construct validity and model development (Hair et al., 2012). Discriminant validity that ensures indicators should measure what they are supposed to measure was determined through heterotrait-monotrait ratio (HTMT) (Rasoolimanesh et al., 2017).

Data Processing and Analysis

Data was imported into SPSS24 (IBM Corporation Business Analytics Software, Chicago) for screening to ensure completeness and accuracy before detailed analysis in Smart-PLS3 (SmartPLS GmbH, Bönningstedt, Germany) software. Data screening is necessary to solve multicollinearity, normality issues, outliers and missing values and obtain highly inter-correlated indicators that enable internal consistency for reflective models (Ringle et al., 2018).

RESULTS

Reliability, validity, collinearity, normality, path model significance, coefficient of determination (R^2) and model fit (standardised root mean square residual, SRMR) were determined after running PLS algorithms and bootstrapping resampling techniques in Smart-PLS 3.2.3 software (Ringle, Wende and Becker, 2015). All composite and indicator coefficients in Table 2 are above 0.7, showing good internal consistency and indicator reliability (Rasoolimanesh et al., 2019). All constructs' AVE coefficients are above 0.5, showing that the variable explains more than 50% of the variance of its indicators, proving sufficient convergent validity (Ringle et al., 2018). HTMT coefficients are below 0.85, showing good discriminant validity as recommended recently (Rasoolimanesh et al., 2019). All variance inflation factor (VIF) coefficients are far below 5, proving that multi-collinearity was not a problem. Skewness and kurtosis statistics for all study variables are respectively within acceptable limits of ± 3 and ± 5, exhibiting fairly normal data distribution (Jondeau and Rockinger, 2003).

Table 2. Reliability test results

Variable	*N* of Items	Scale	Composite Reliability (ρ_c)	AVE	VIF
Familiarity	3	1 to 5	0.819	0.602	1.198
Monitoring activities	3	1 to 5	0.863	0.682	1.388
Professionalism	5	1 to 5	0.843	0.518	1.389
Sanctions	3	1 to 5	0.780	0.553	1.526
Perceived inefficiency	3	1 to 5	0.799	0.571	1.551
Contractors' resistance	2	1 to 5	0.771	0.629	1.431
Compliance	3	1 to 5	0.818	0.604	1.380
Project success	3	1 to 5	0.867	0.686	

Path Coefficients, Coefficient of Determination and Model Fit

PLS-Algorithms output was assessed for model identification and to determine relationship prediction based on path coefficients whereby coefficients ≥ 0.1 prove that independent variables are well represented and model identified (Hair et al., 2012). All the analyses converged at 11 interactions far below the pre-set 300-stop criterion that implied good convergence and prediction. Furthermore, to ascertain predictive significance for accepting and rejecting hypotheses, bootstrapping was run with 5000 bootstrap samples and respective results are presented in Table 3. In addition, the coefficient of determination was used to determine predictive performance of the success model for the public road construction project. The results in Table 4 show that the explained variances for the model are significantly good (R^2 = 0.527, p < 0.001), implying acceptable predictive performance (Rasoolimanesh et al., 2019). Consequently, the 52.7% variance in public road construction project success is substantially explained by the seven project success factors. Finally, acceptable model fitting is important to determine whether the underlying theory is reflected in the data. This finding is simply empirical evidence to prove that the estimated model fits the data collected (Müller, Schuberth and Henseler, 2018). Model fit was determined through SRMR. As depicted in Table 4, the SRMR obtained shows that the overall model is significantly fitting well since the value is less than 0.08 (SRMR = 0.075, P < 0.001) (Rasoolimanesh et al., 2019). The result implies that while compared to the saturated model, the estimated model in set-up theory represented by the conceptual model matches the collected data.

Table 3. Path coefficients

	Original Sample (*α*)	**Sample Mean (*M*)**	**Standard Deviation**	***T* Statistics (*t*)**	***p*-Values**
Compliance – Project success	0.250	0.247	0.081	3.097	0.002
Familiarity – Project success	0.107	0.109	0.065	1.639	0.101
Monitoring – Project success	0.184	0.185	0.074	2.482	0.013
Professionalism – Project success	0.365	0.370	0.066	5.554	0.000
Perceived inefficiency – Project success	–0.112	–0.112	0.073	1.537	0.124
Contractors' resistance – Project success	0.182	0.176	0.085	2.141	0.032
Sanctions – Project success	–0.132	–0.126	0.077	1.710	0.087

Table 4. R^2, adjusted R^2 and SRMR

	Original Sample (*o*)	**Sample Mean (*M*)**	**Standard Deviation**	***T* Statistics (*t*)**	***p*-Values**
Coefficient of determination (R^2)	0.527	0.560	0.053	9.943	0.000
SRMR	0.075	0.094	0.007	11.365	0.000

DISCUSSION

The discussion of results is based on path coefficient significance levels that were verified to determine the relationship between variables by evaluating *p*-values and *t*-values.

Compliance and Project Success

There is a significant positive relationship between compliance with the public procurement regulatory framework and the success of public road construction projects ($\alpha = 0.250$, $t = 3.097$, $p = 0.002$) at 1% significance level. The result implies that compliance with the public procurement regulatory framework by staff on public road construction projects predicted the success of these projects and requires management to emphasise compliance throughout project implementation. The findings are in line with Amade, Ogbonna and Nkeleme (2022) and Zadawa, Hussin and Osmadi (2018a). Management should encourage proper authorisation of road construction projects, timely delivery of road construction projects, timely recording of road construction transactions and achievable project objectives. Institutional theory contends that organisational success depends on compliance with effective institutional norms (Kondra and Hinings, 1998). The complexity of

public road construction projects with multiple stakeholders and directives from the government and donors complicate the implementation process with demand from multiple stakeholders. However, harmonising all the policies, procedures and directives from different stakeholders is paramount to the success of these projects.

Familiarity and Project Success

There is an insignificant positive relationship between familiarity with public procurement regulatory framework and public road construction project success (a = 0.107, t = 1.639, p = 0.101) at a 5% significance level. This finding implies that familiarity with the public procurement regulatory framework predicted the success of public road construction projects. Despite the prediction, it is not sufficient since the p-value is more than 0.05, implying that familiarity with the public procurement regulatory framework insignificantly enhances the success of public road construction project. Management should encourage qualified and competent staff involvement in public road implementation since these are key indicators measuring familiarity with the public procurement regulatory framework. This requirement is inevitable since many construction projects have failed due to deploying staff who are unfamiliar with project requirements. This finding is in line with literature showing that improving staff knowledge is important for a successful construction sector (Khamaksorn, Tah and Kurul, 2022; Munyasya and Chileshe, 2018).

Monitoring Activities and Project Success

There is a significant positive relationship between monitoring activities of public road construction projects and the success of these projects (a = 0.184, t = 2.482, p = 0.013) at a 1% significance level, implying that monitoring activities predicted the success of these projects. Hence, it necessitates management to effectively monitor public road construction projects to influence implementation team to stick to project targets and identify areas of improvement. This measure should be done through frequent inspections to check on the timely recording of project progress, timely project completion and proper storage methods. Effectively monitoring public road construction projects enhances the success of these projects and corresponds to earlier studies (Osuizugbo et al., 2022; Mwelu et al., 2019). Agency and institutional theories confirm that effective monitoring is required for successful performance (Love et al., 2017). Successful procurement of public projects is highly dependent upon increased monitoring of procurement activities and management should actively monitor public road construction projects to determine if they are implemented in accordance with project specifications, on time and within budget. This measure would ensure that set objectives are achieved.

Professionalism and Project Success

There is a significant positive relationship between professionalism among staff and public road construction project success (a = 0.365, t = 5.554, p = 0.000) at a 1% significance level, implying that professionalism among staff involved in public road construction projects predicted successful project implementation. This finding requires management to emphasise competence, integrity and training

of staff involved in public road construction projects to strengthen professionalism and enable them to implement public road construction projects successfully. The government should encourage high staff professional integrity judgement during decision-making, a high level of confidentiality and employ practically experienced road construction staff with the required expertise. This measure is in conformance with institutional theory and recent studies requiring staff competence for organisational success and project implementation (DiMaggio and Powell, 2015). Professionalism ensures project success when staff are knowledgeable about particular project requirements (Latiff, Jaapar and Isa, 2022; Giroud et al., 2018). Hence, investing in staff competence is important for public road construction projects. Management should determine project requirements from the initiation stage through to project completion. This measure would help management source the right personnel with the required expertise and competence to execute the project.

Perceived Inefficiency and Project Success

There is an inverse insignificant relationship between the perceived inefficiency of the public procurement regulatory framework and public road construction project success (a = –0.112, t = 1.537, p = 0.124) at a 5% significance level, implying that the perceived inefficiency of public procurement regulatory framework predicted reduction in public road construction projects success confirming that successful organisations rely on effectiveness institutional norms (Oliver, 1991). This finding is further supported by the argument that successful public construction projects require stakeholders' understanding of the project scope with a clear governing regulatory framework capable of eradicating manipulations (Zhang et al., 2016). Whereas the perceived inefficiency of the public procurement regulatory framework reduces successful public road construction project implementation, the reduction is not significant. This finding is attributed to the tremendous improvement of the regulatory framework through numerous reforms, given that the public procurement regulatory framework has been unclear previously (Odhiambo and Kamau, 2003).

Contractors' Resistance and Project Success

There is a positive significant relationship between contractors' resistance to non-compliance with public procurement regulatory framework and public road construction project success (a = 0.182, t = 2.141, p = 0.032) at a 5% significance level, implying that contractors' resistance to non-compliance with the public procurement regulatory framework governing public road construction projects predicted significantly the success of these projects. The results contradict previous studies in the Netherlands that established contractors' resistance has an insignificant effect on public procurement (Gelderman, Ghijsen and Brugman, 2006). However, current findings are supported by recent compliance studies on public road construction projects (Zulkeflee et al., 2022, Mwelu et al., 2018). Hence, management should empower contractors by increasing their knowledge of the public road procurement process and encouraging them to act against defiant public officers. Creating awareness among public road construction team will help them understand the benefits of complying with the regulatory framework to meet

government goals. This measure should be aligned with organisational objectives with an effective mechanism denying deviant public officers from retaliating (Gelderman, Ghijsen and Schoonen, 2010). This finding is in line with institutional theory, revealing that successful performance depends on perceived organisational norms by different stakeholders having specific reasons for accomplishing tasks correctly (Greenwood and Hinings, 1996). Despite contractors' commitment to fulfil their mandate, an effective regulatory framework is inevitable to support their actions.

Sanctions and Project Success

There is an insignificant inverse relationship between sanctions on officers involved in public road construction projects and public road project success (a = –0.132, t = 1.710, p = 0.087) at a 5% significance level, implying that sanctions imposed on these officers did not predict success of public road construction projects. Thus, management may not continuously threaten to apprehend staff involved in public road construction projects as may not lead to improvement in the implementation process. The results contradict various studies and the institutional theory that proposed sanctions for successful organisational performance and meeting its objectives (Chan and Owusu, 2017; North, 2016). The reason might be that the Ugandan government, through the Parliament and Anti-corruption court, currently has embarked on serious condemnation and prosecution of guilty public road stakeholders, including imprisonment and recovering lost funds. Further, PPDA Authority (Public Procurement and Disposal of Public Assets Authority) is empowered to punish deviant stakeholders and termination of contracts (PPDA Authority, 2008). Such measures have caused fear among the public road implementation team in Uganda.

CONTRIBUTIONS OF THE STUDY

The study contributes to the existing body of knowledge by proving that compliance with the public procurement regulatory framework, monitoring activities on public road construction project, professionalism among staff concerned with the public road construction projects and contractors' resistance to non-compliance are significant factors responsible for successful implementation of public road construction projects. Previously, project success factors, including but not limited to time, cost, quality and safety, were widely applied (Tayeh et al., 2018). However, complex construction projects in a dynamic construction industry require continuous scanning to establish more factors and cope with industry dynamics. This situation calls for construction industry stakeholders to consider these emerging significant factors that are unearthed when implement construction projects.

CONCLUSIONS

The purpose of this research was to establish predictors of success factors for implementing road construction projects motivated by numerous reports revealing cost and schedule overruns as well as substandard works as key constraints surrounding the construction projects. The study established that compliance with the public procurement regulatory framework, monitoring activities, professionalism of staff and contractors' resistance to non-compliance significantly enhanced the successful implementation of public road construction projects. While familiarity with the regulatory framework, perceived inefficiency and sanctions did not enhance the success of road construction projects. For the government to achieve value for money, increase the paved road network and steer economic development, a sound public procurement regulatory framework, monitoring activities, professionalism and encouragement of contractors to act against bad decisions are paramount to successfully implementing public road construction projects.

The study was limited to Uganda's three public agencies (Ministry of Works and Transport, Uganda Road Fund and Public Procurement and Disposal of Public Assets Authority) directly involved in public road construction; however, other agencies (i.e., Ministry of Finance, President's Office, among others) indirectly involved in public road implementation were left out. Hence, future studies should consider other public entities. In addition, this study was limited to seven factors affecting the success of public road construction implementation. These limitations call for more studies to comprehensively establish more success factors beyond the seven factors discussed in this article for implementing road construction projects.

REFERENCES

Akin, F.D., Polat, G., Turkoglu, H. and Damci, A. (2021). A crashing-based time-cost trade-off model considering quality cost and contract clauses. *International Journal of Construction Management*, 23(6): 954–963. https://doi.org/10.1080/15623599.2021.1946899

Alinaitwe, H.M., Apolot, R. and Tindiwensi, D. (2013). Investigation into the causes of delays and cost overruns in Uganda's public sector construction projects. *Journal of Construction in Developing Countries*, 18(2): 33–47.

Alinaitwe, H.M., Mwakali, J.A. and Hansson, B. (2007). Factors affecting the productivity of building craftsmen-studies of Uganda. *Journal of Civil Engineering and Management,* 13(3): 169–176. https://doi.org/10.3846/13923730.2007.9636434

Amade, B., Ogbonna, A.C. and Nkeleme, E.I. (2022). An investigation of the factors affecting successful enterprise resource planning (ERP) implementation in Nigeria. *Journal of Construction in Developing Countries*, 27(1): 41–63. https://doi.org/10.21315/jcdc2022.27.1.3

Ameyaw, E.E., Pärn, E., Chan, A.P., Owusu-Manu, D.-G., Edwards, D.J. and Darko, A. (2017). Corrupt practices in the construction industry: Survey of Ghanaian experience. *Journal of Management in Engineering*, 33(6): 05017006. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000555

Atkinson, R. (1999). Project management: Cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management*, 17(6): 337–342. https://doi.org/10.1016/S0263-7863(98)00069-6

Australasian Procurement and Construction Council (APCC) (2013). *Procurement of Construction Products: A Guide to Achieving Compliance*. Deakin, ACT: APCC.

Babalola, M.T., Stouten, J., Euwema, M.C. and Ovadje, F. (2016). The relation between ethical leadership and workplace conflicts: The mediating role of employee resolution efficacy. *Journal of Management*, 44(5): 2037–2063. https://doi.org/10.1177/0149206316638163

Bapat, H., Sarkar, D. and Gujar, R. (2021). Selection of sustainable materials for energy savings of infrastructure-transportation project in Ahmedabad, India using BIM and FCM. *Journal of Construction in Developing Countries*, 26(2): 135–161. https://doi.org/10.21315/jcdc2021.26.2.7

Bartle, J.R. and Korosec, R.L. (2003). A review of state procurement and contracting. *Journal of Public Procurement*, 3(2): 192–214. https://doi.org/10.1108/JOPP-03-02-2003-B003

Chan, A.P. and Owusu, E.K. (2017). Corruption forms in the construction industry: Literature review. *Journal of Construction Engineering and Management*, 143(8): 04017057. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001353

Cornish, K. and Mugova, A. (2014). Improving access to finance for small- and medium-sized enterprises in the road sector: The CrossRoads Guarantee Fund in Uganda. *Enterprise Development and Microfinance*, 25(2): 135–149.

Decarolis, F., Giuffrida, L.M., Iossa, E., Mollisi, V. and Spagnolo, G. (2018). Bureaucratic competence and procurement outcomes. NBER Working Paper 24201, National Bureau of Economic Research, Massachusetts Avenue, Cambridge. https://doi.org/10.3386/w24201

Dimaggio, P.J. and Powell, W.W. (2015). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields [1983]. *Contemporary Sociological Theory*, 175.

Ford, B. (2011). Overruns add millions to the cost of state road projects. *The Eagle-Tribune*, 14 August.

Furneaux, C., Brown, K., Don, A., Neil, A., McConville, S., McFallan, S., London, K. and Burgess, K. (2006). Client capabilities and capital works procurement policies: A comparative analysis of Australian jurisdictions. In K. Brown, K. Hampson and P. Brandon (eds.), *Clients Driving Construction Innovation: Moving Ideas into Practice. Brisbane: Cooperative Research Centre for Construction Innovation*. Brisbane: Icon.Net Pty Ltd, 62–71.

Gambo, N., Said, I. and Ismail, R. (2016). Influences of cost factors affecting technical performance of local government projects in Nigeria: A partial least square-structural equation modelling (PLS-SEM) approach. *Journal of Construction in Developing Countries*, 21(1): 85–111. https://doi.org/10.21315/jcdc2016.21.1.5

Gelderman, K., Ghijsen, P. and Schoonen, J. (2010). Explaining non-compliance with European Union procurement directives: A multidisciplinary perspective. *JCMS: Journal of Common Market Studies*, 48(2): 243–264. https://doi.org/10.1111/j.1468-5965.2009.02051.x

Gelderman, C.J., Ghijsen, P.W.T. and Brugman, M.J. (2006). Public procurement and EU tendering directives-explaining non-compliance. *International Journal of Public Sector Management*, 19(7): 702–714. https://doi.org/10.1108/09513550610704716

Giroud, S., Grandjean, A., Jahns, F., Cobuccio, L., Castioni, J., Grasset, N., Sartori, C. and Saraga, M. (2018). The «Oslen» group: A new opportunity to think about «becoming a physician». *Revue Médicale Suisse*, 4(628): 2104–2108. https://doi.org/10.53738/REVMED.2018.14.628.2104

Gómez-Cabrera, A., Salazar, L.A., Ponz-Tienda, J.L. and Alarcón, L.F. (2020). Lean tools proposal to mitigate delays and cost overruns in construction projects. In *Proceedings: 28th Annual Conference of the International Group for Lean Construction (IGLC)*. Berkeley: IGLC, 781–792.

Greenwood, R. and Hinings, C.R. (1996). Understanding radical organizational change: Bringing together the old and the new institutionalism. *The Academy of Management Review*, 21(4): 1022–1054. https://doi.org/10.2307/259163

Hair, J.F., Sarstedt, M., Pieper, T.M. and Ringle, C.M. (2012). The use of partial least squares structural equation modelling in strategic management research: A review of past practices and recommendations for future applications. *Long Range Planning*, 45(5–6): 320–340. https://doi.org/10.1016/j.lrp.2012.09.008

Hamta, N., Ehsanifar, M. and Sarikhani, J. (2021). Presenting a goal programming model in the time-cost-quality trade-off. *International Journal of Construction Management*, 2(1): 1–11. https://doi.org/10.1080/15623599.2018.1502930

Hussain, S., Fangwei, Z. and Ali, Z. (2019). Examining influence of construction projects' quality factors on client satisfaction using partial least squares structural equation modelling. *Journal of Construction Engineering and Management*, 145: 05019006. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001655

Hussein, K., Yusof, J.M. and Jaafar, S. (2020). An observational study on forest landscape conservation in Malaysia via the establishment of Forestry Educational Centres. *Journal of Construction in Developing Countries*, 25(2): 153–173. https://doi.org/10.21315/jcdc2020.25.2.6

Jondeau, E. and Rockinger, M. (2003). Conditional volatility, skewness, and kurtosis: existence, persistence, and comovements. *Journal of Economic dynamics and Control*, 27(10): 1699–1737. https://doi.org/10.1016/S0165-1889(02)00079-9

Kagioglou, M., Cooper, R., Aouad, G. and Sexton, M. (2000). Rethinking construction: The generic design and construction process protocol. *Engineering, Construction and Architectural Management*, 7(2): 141–153. https://doi.org/10.1108/eb021139

Kahvandi, Z., Saghatforoush, E., Zareravasan, A. and Viana, M.L. (2020). A review and classification of integrated project delivery implementation enablers. *Journal of Construction in Developing Countries*, 25(2): 219–236. https://doi.org/10.21315/jcdc2020.25.2.9

Khamaksorn, A., Tah, J.H. and Kurul, E. (2022). Social networks and knowledge transfer in international construction joint venture projects: A case study in Thailand. *Journal of Construction in Developing Countries*, 27(1): 111–137. https://doi.org/10.21315/jcdc2022.27.1.7

Kondra, A.Z. and Hinings, C.R. (1998). Organizational diversity and change in institutional theory. *Organization Studies*, 19(5): 743–767. https://doi.org/10.1177/017084069801900502

Krejcie, R.V. and Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3): 607–610. https://doi.org/10.1177/001316447003000308

Kukoyi, P.O., Simpeh, F., Adebowale, O.J. and Agumba, J.N. (2021). Managing the risk and challenges of COVID-19 on construction sites in Lagos, Nigeria. *Journal of Engineering, Design and Technology*, 20(1): 99–144. https://doi.org/10.1108/JEDT-01-2021-0058

Lapidus, A.A. and Yves, N. (2018). Integrated quality index of organizational and technological solutions for implementation of Burundian Capital Master Plan. *Materials Science Forum*, 931: 1295–1300. https://doi.org/10.4028/www.scientific.net/MSF.931.1295

Latiff, A.M.A., Jaapar, A. and Isa, C.M.M. (2022). Factors influencing governance practices in rural development projects: A case study of rural road projects in Malaysia. *Journal of Construction in Developing Countries*, 27(2): 1–16. https://doi.org/10.21315/jcdc-11-20-0245

Lee, Z.P., Rahman, R.A. and Doh, S.I. (2021). Key drivers for adopting design-build in public construction projects: Malaysian perspective. *Journal of Construction in Developing Countries*, 26(1): 131–160. https://doi.org/10.21315/jcdc2021.26.1.7

Love, P.E.D., Ahiaga-Dagbui, D.D., Smith, S.D., Sing, M.C.P. and Tokede, O. (2018). Cost profiling of water infrastructure projects. *Journal of Infrastructure Systems*, 24(4): 04018023. https://doi.org/10.1061/(ASCE)IS.1943-555X.0000441

Love, P.E.D., Sing, M.C.P, Ika, L.A. and Newton, S. (2019). The cost performance of transportation projects: The fallacy of the planning fallacy account. *Transportation Research Part A: Policy and Practice*, 122: 1–40. https://doi.org/10.1016/j.tra.2019.02.004

Love, P.E.D, Veli, S., Davis, P., Teo, P. and Morrison, J. (2017). See the difference in a precast facility: Changing mindsets with an experiential safety program. *Journal of Construction Engineering and Management*, 143(2): 05016021. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001224

Luong, D.-L., Tran, D.-H. and Nguyen, P.T. (2021). Optimizing multi-mode time-cost-quality trade-off of construction project using opposition multiple objective difference evolution. *International Journal of Construction Management*, 21(3): 271–283. https://doi.org/10.1080/15623599.2018.1526630

Marnewick, C., Erasmus, W. and Nazeer, J. (2018). *The Symbiosis between Information System Project Complexity and Information System Project Success*. Cape Town: AOSIS. https://doi.org/10.4102/aosis.2017.itpsc45

Ministry of Works and Transport (2015). *Annual Sector Performance Report 2014/2015*. Kampala, Uganda: Ministry of Works and Transport. Available at: https://www.works.go.ug/wp-content/uploads/2016/03/Final-MoWT-ASPR-Report-2014-15.pdf [Accessed on 20 August 2016].

_____. (2014). *Annual Performance Report 2013/2014*. Kampala, Uganda: Ministry of Works and Transport. Available at: https://works.go.ug/wp-content/uploads/2015/08/Annual-Works-and-Transport-Sector-Performance-Report-For-Financial-Year-2013-14.pdf [Accessed on 20 August 2016].

Moyo, T., Crafford, G. and Emuze, F. (2022). Significant decent work objectives for monitoring construction workers' productivity performance in Zimbabwe. *Journal of Construction in Developing Countries*, 27(1): 95–110. https://doi.org/10.21315/jcdc2022.27.1.6

Müller, T., Schuberth, F. and Henseler, J. (2018). PLS path modelling–a confirmatory approach to study tourism technology and tourist behaviour. *Journal of Hospitality and Tourism Technology*, 9(3): 249–266. https://doi.org/10.1108/JHTT-09-2017-0106

Munyasya, B. and Chileshe, N. (2018). Towards sustainable infrastructure development: Drivers, barriers, strategies, and coping mechanisms. *Sustainability*, 10(12): 4341. https://doi.org/10.3390/su10124341

Mwelu, N., Davis, P.R., Ke, Y. and Watundu, S. (2018). Compliance within a regulatory framework in implementing public road construction projects. *Construction Economics and Building*, 18(4): 1–23. https://doi.org/10.5130/AJCEB.v18i4.6362

Mwelu, N., Davis, P.R., Ke, Y., Watundu, S. and Jefferies, M. (2019). Success factors for implementing Uganda's public road construction projects. *International Journal of Construction Management*, 21(6): 598–614. https://doi.org/10.1080/15623599.2019.1573481

New Vision. (2016a). UNRA queried over sh300b contract Kanoni-Ssembabule-Villa Maria Road. 20 October. Available at: https://www.google.com.au/search?q=New+Vision,+20th+October+2016.+UNRA+queried+over+sh300b+contract+Kanoni-Ssembabule-Villa+maria+road.&rlz=1C1GGRV_7AU787&tbm=isch&tbo=u&sier7nhiYPfAhUBeisKHR3ADIQQ7Al6BAgFEA0&biw=1920&bih=920 [Accessed on 27 October 2016].

_____. (2016b). 24 billion lost in Mukono road project. 28 July. Available at: http://accu.or.ug/sh24b-lost-in-mukono-road-project [Accessed on 27 October 2016].

North, D.C. (2016). Institutions and economic theory. *The American Economist*, 61(1): 72–76. https://doi.org/10.1177/0569434516630194

Ntayi, J.M., Rooks, G., Eyaa, S. and Qian, C. (2010). Perceived project value, opportunistic behavior, interorganizational cooperation, and contractor performance. *Journal of African Business*, 11: 124–141. https://doi.org/10.1080/15228911003608603

Odhiambo, W. and Kamau, P. (2003). Public procurement: Lessons from Kenya, Tanzania, and Uganda. OECD Development Centre Working Papers 208, OECD Publishing, Paris. https://doi.org/10.1787/804363300553

Ofori-Kuragu, J.K., Owusu-Manu, D.G. and Ayarkwa, J. (2016). The case for a construction industry council in Ghana. *Journal of Construction in Developing Countries*, 21(2): 131–149. https://doi.org/10.21315/jcdc2016.21.2.7

Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Review*, 16(1): 145–179. https://doi.org/10.2307/258610

Osuizugbo, I.C., Kukoyi, P.O., Olusola, R. and Akindele, N.A. (2022). Determinants of successful completion of construction craft apprenticeship in Lagos State, Nigeria: A qualitative study. *Journal of Construction in Developing Countries*, 27(2): 163–182. https://doi.org/10.21315/jcdc-12-20-0257

Othman, I., Hashim, Z., Mohamad, H. and Napiah, M. (2018) The framework for effective human resource management at construction site. *MATEC Web of Conferences*, 203: 02002. https://doi.org/10.1051/matecconf/201820302002

Owusu, E.K., Chan, A.P. and Shan, M. (2017). Causal factors of corruption in construction project management: An overview. *Science and Engineering Ethics*, 25: 1–31. https://doi.org/10.1007/s11948-017-0002-4

Pheng, L.S. and Chuan, Q.T. (2006). Environmental factors and work performance of project managers in the construction industry. *International Journal of Project Management*, 24(1): 24–37. https://doi.org/10.1016/j.ijproman.2005.06.001

PPDA Authority (Public Procurement and Disposal of Public Assets Authority) (2008). Workshop on challenges facing construction sector in Uganda. Available at: http://docplayer.net/40154255-Workshop-on-challenges-facing-the-construction-sector-in-uganda.html [Accessed on 27 October 2016].

Rafferty, M. and Toner, P. (2018). Thinking like capital markets–financialisation of the Australian construction industry. *Construction Management and Economics*, 37(3): 156–168. https://doi.org/10.1080/01446193.2018.1513163

Rafique, M., Ahmed, S. and Ismail, M. (2021). Impact of safety climate on safety behaviour in construction projects: Mediating mechanism and interacting effect. *Journal of Construction in Developing Countries*, 26(2): 163–181. https://doi.org/10.21315/jcdc2021.26.2.8

Rasoolimanesh, S.M., Md Noor, S., Schuberth, F. and Jaafar, M. (2019). Investigating the effects of tourist engagement on satisfaction and loyalty. *The Service Industries Journal*, 39(7–8): 559–574. https://doi.org/10.1080/02642069.2019.1570152

Rasoolimanesh, S.M., Ringle, C.M., Jaafar, M. and Ramayah, T. (2017). Urban vs. rural destinations: Residents' perceptions, community participation and support for tourism development. *Tourism Management*, 60: 147–158. https://doi.org/10.1016/j.tourman.2016.11.019

Renault, B.Y., Agumba, J.N. and Ansary, N. (2020). Establishing core factors of risk management influencing performance outcome of mmall and medium firm's construction projects in Gauteng. *Journal of Construction in Developing Countries*, 25(2): 93–127. https://doi.org/10.21315/jcdc2020.25.2.4

Ringle, C.M., Sarstedt, M., Mitchell, R. and Gudergan, S.P. (2018). Partial least squares structural equation modelling in HRM research. *The International Journal of Human Resource Management*, 31(12): 1617–1643. https://doi.org/10.1080/09585192.2017.1416655

Ringle, C.M., Wende, S. and Becker, J. (2015). *SmartPLS 3*. Boenningstedt, Germany: SmartPLS GmbH.

Saidu, I. and Shakantu, W. (2016). The contributions of construction material waste to project cost overruns in Abuja, Nigeria. *Acta Structilia: Journal for the Physical and Development Sciences*, 23(1): 99–113. https://doi.org/10.18820/24150487/as23i1.4

Sanda, Y.N., Anigbogu, N.A., Izam, Y.D. and Nuhu, L.Y. (2022). Managing stakeholder opportunism in public-private partnership (PPP) housing projects. *Journal of Construction in Developing Countries*, 27(1): 213–228. https://doi.org/10.21315/jcdc2022.27.1.12

Sanga, S.A. (2020). Compliance with building material specifications among informal skilled construction workers in Dar es Salaam, Tanzania. *Journal of Construction in Developing Countries*, 25(2): 63–91. https://doi.org/10.21315/jcdc2020.25.2.3

Sarstedt, M., Ringle, C.M., Cheah, J.-H., Ting, H., Moisescu, O.I. and Radomir, L. (2019). Structural model robustness checks in PLS-SEM. *Tourism Economics*, 26(4): 531–554. https://doi.org/10.1177/1354816618823921

Schapper, P.R., Malta, J.N.V. and Gilbert, D.L. (2006). An analytical framework for the management and reform of public procurement. *Journal of Public Procurement*, 6(1/2): 1–26. https://doi.org/10.1108/JOPP-06-01-02-2006-B001

Sekaran, U. and Bougie, R. (2010). *Research Methods for Business: A Skill Building Approach*. Edinburgh: John Wiley & Sons.

Shan, M., Le, Y., Yiu, K.T.W., Chan, A.P.C. and Hu, Y. (2017). Investigating the underlying factors of corruption in the public construction sector: Evidence from China. *Science and Engineering Ethics*, 23: 1643–1666. https://doi.org/10.1007/s11948-016-9865-z

Simushi, S. and Wium, J. (2020). Time and cost overruns on large projects: understanding the root cause. *Journal of Construction in Developing Countries*, 25(1): 129–146. https://doi.org/10.21315/jcdc2020.25.1.7

Snyder, C.S. (2013). *A User's Manual to the PMBOK Guide*. Hoboken, NJ: John Wiley & Sons.

Sohail, M. and Cavill, S. (2008). Accountability to prevent corruption in construction projects. *Journal of Construction Engineering and Management*, 134(9): 729–738. https://doi.org/10.1061/(ASCE)0733-9364(2008)134:9(729)

Sweis, R.J., Bisharat, S.M., Bisharat, L., Sweis, G. (2014). Factors affecting contractor performance on public construction projects. *Life Science Journal*, 11(4s): 28–39.

Tabish, S.Z.S. and Jha, K.N. (2015). Point of view: Success factors for safety performance in public construction projects. *Indian Concrete Journal*, 89(2): 58–72.

Tayeh, B.A., Al Hallaq, K., Alaloul, W.S. and Kuhail, A. R. (2018). Factors affecting the success of construction projects in Gaza Strip. *The Open Civil Engineering Journal*, 12: 301–315. https://doi.org/10.2174/1874149501812010301

Tutesigensi, A., Kibwami, N. and Matege, S.B. (2021). The status of value management practice on construction projects in Uganda and strategies for improvement. *Journal of Construction in Developing Countries*, 26(2): 251–267. https://doi.org/10.21315/jcdc2021.26.2.12

Uganda National Road Authority (2014). *End of Year Performance Workshop*. Kampala, Uganda: Uganda National Roads Authority. Available at: https://www.unra.go.ug/en/welcome [Accessed on 21 December 2016].

Um, K.-H. and Kim, S.-M. (2018). Collaboration and opportunism as mediators of the relationship between NPD project uncertainty and NPD project performance. *International Journal of Project Management*, 36(4): 659–672. https://doi.org/10.1016/j.ijproman.2018.01.006

Van Roy, A.F. and Firdaus, A. (2020). Building information modelling in Indonesia: Knowledge, implementation and barriers. *Journal of Construction in Developing Countries*, 25(2): 199–217. https://doi.org/10.21315/jcdc2020.25.2.8

Van Slyke, D. M. (2007). Agents or stewards: Using theory to understand the government-nonprofit social service contracting relationship. *Journal of Public Administration Research and Theory*, 17(2): 157–187. https://doi.org/10.1093/jopart/mul012

Walker, D.H.T. and Lloyd-Walker, B.M. (2015). *Collaborative Project Procurement Arrangements*. Newtown Square, PA: Project Management Institute, Inc.

Watson, T. (2002). Professions and professionalism: Should we jump off the bandwagon, better to study where it is going? *International Studies of Management and Organization*, 32(2): 93–105. https://doi.org/10.1080/00208825.2002.11043660

White, D. and Fortune, J. (2002). Current practice in project management: An empirical study. *International Journal of Project Management*, 20(10): 1–11. https://doi.org/10.1016/S0263-7863(00)00029-6

Wright, P., Mukherji, A. and Kroll, M.J. (2001). A re-examination of agency theory assumptions: extensions and extrapolations. *The Journal of Socio-Economics*, 30(5): 413–429. https://doi.org/10.1016/S1053-5357(01)00102-0

_____. (2018b). Mediating effects of enforcement on public procurement guidelines' compliance barriers and cost performance of construction projects in Nigerian federal universities: A process macro approach. *Journal of Construction in Developing Countries*, 23(1): 81–102. https://doi.org/10.21315/jcdc2018.23.1.5

Zadawa, A.N., Hussin, A.A. and Osmadi, A. (2018a). The mediating effects of awareness on the relationship between procurement manual compliance's barriers and cost performance of construction projects. *Planning Malaysia Journal*, 16(6). https://doi.org/10.21837/pm.v16i6.474

Zhang, B., Le, Y., Xia, B. and Skitmore, M. (2016). Causes of business-to-government corruption in the tendering process in China. *Journal of Management in Engineering*, 33(2): 05016022. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000479

Zhang, L. and Sunindijo, R.Y. (2021). Emotional intelligence of local and overseas graduates in real estate industry in China. *Journal of Construction in Developing Countries*, 26(1): 185–204. https://doi.org/10.21315/jcdc2021.26.1.9

Zhou, C., Luo, H., Fang, W., Wei, R. and Ding, L. (2019). Cyber-physical-system-based safety monitoring for blind hoisting with the internet of things: A case study. *Automation in Construction*, 97: 138–150. https://doi.org/10.1016/j.autcon.2018.10.017

Zulkeflee, A.A., Faisol, N., Ismail, F. and Ismail, N.A.A. (2022). Safety compliances enhancement: Foreign labours behaviour in the Malaysian construction site. *Journal of Construction in Developing Countries*, 27(1): 153–171. https://doi.org/10.21315/jcdc2022.27.1.9