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Impact of Risk Factors Associated with Procurement Process on Time Performance of Public Institutional Building Projects in Edo State, Nigeria

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Abstract- ***Public construction projects in Edo State are frequently challenged by delays, which undermine project objectives, inflate costs and reduce stakeholder satisfaction. The study examines the impact of risk factors associated with procurement process on the time performance of public institutional building projects in Edo State, Nigeria. It identified a generic procurement process; the key risk factors associated with procurement process, the impact of risk factors on time performance, and propose strategies for mitigating risk factors associated with procurement process to improve time performance in selected public institutional building projects. A quantitative survey research design was adopted for the study; primary data were collected through structured questionnaires administered to construction professionals, procurement officers and contractors involved in public institutional projects in Edo State. Quantitative data were analysed using descriptive statistics and regression analysis to establish the strength and significance of relationship between risk factors and time performance. Results indicate that preparation of bidding documents and evaluation criteria were the most important procurement process and the most frequently occurring risks are fraud and corruption. Furthermore, the results reveal that there is a significant high relationship between risk factors associated with procurement process and time performance and comprehensive procurement planning and early risk assessment was identified as the most effective mitigating strategies. The findings underscore the need for streamlined procurement procedures, enhanced capacity building for procurement professionals and the adoption of transparent and efficient contractor prequalification systems. The study concludes that mitigating procurement risk factors is essential to improve the timely delivery of public institutional building projects in Edo State and recommends that there should be policy reforms and the implementation of best practices in public sector procurement to strength project time performance and enhances value for public investment.***

Index Terms- ***Procurement Process, Public Institutional Building Projects, Project Delays, Risk Factors, Time performance***

I. INTRODUCTION

The construction industry is very important to the economic development of any nation especially in an expanding economy like Nigeria [1]. Procurement processes perform a central role in shaping project time performance in the construction industry, especially for public institutions' building project where regulatory, administrative and managerial procedures are formalized. Procurement refers to the systematic set of activities involved in acquiring materials, services and works necessary to deliver a project from planning through completion. These activities include needs identification, method selection, bidding, and contract and execution oversight. Procurement in public building projects encompasses a series of structured activities through which public institutions plan, solicit, evaluate and award contracts for construction works. [2] identified the following procurement process- contract review and award, preparation and issuance of solicitation document, operational procurement planning, contract finalization and issuance, receipts and opening of offers, evaluation, selection of a procurement strategy, requirement of definition and sourcing. Inefficiencies and risks embedded in procurement processes can profoundly influence the time performance of construction projects often resulting in delays, cost overruns, and under achievement of project goals [3]. Procurement related risks arise from uncertainties and inefficiencies at various stages of the procurement lifecycle from planning and budgeting through bidding and contractor selection, to contract administration and

delivery. Research on construction procurement in Nigeria highlights that risks such as conflict of interest, poor technical feasibility assessments, corruption and lack of transparency, inadequate bid evaluation, budget appropriation delays, and non-compliance with regulatory frameworks significantly hinder effective procurement performance. These risks do not only compromise fairness and accountability but also have downstream effects on project schedules often leading to delays in acquisition of resources, contractor mobilization and execution of works.

Several studies have linked public procurement process risk factors with poor project performance outcomes. For instance, budgetary and resource allocation risks such as delays in budget approvals and inaccurate market price forecasting have been shown to statistically highlighting the sensitivity of construction schedules to procurement uncertainties. Furthermore, evidence from tertiary institution projects in Nigeria indicates that incomplete compliance with procurement regulations and ineffective risk management practices contribute to unnecessary delays and disputes among project stakeholders [4]. Time performance is the process of comparing actual work with schedule. It is a key indicator of project success because timely delivery affects cost, quality and stakeholder satisfaction. A construction project time performance is judged by the degree to which is completed within the schedule duration, with delays reflecting poor time performance [5]. The impact of risks associated with procurement processes on project time performance is particularly pronounced in public institutions where bureaucratic procedures, rigid regulatory requirements and limited capacity for proactive risk management often prolong procurement lead times. Delays during the procurement cycle, stemming from poor planning, evaluation issues, bottlenecks, and documentation errors, compound scheduling challenges during the construction phase, frequently causing projects to exceed their planned completion date [6]. The aim of this study is to examine the impact of risks associated with the procurement process on time performance of selected public institution building projects in Edo State and the objectives are to identify a Generic procurement process of Public institution building projects in Edo State, identify the key risks associated with procurement process in selected public institution building projects in Edo State, examine impact of risk factors on time performance and propose strategies for mitigating procurement risks to improve time performance in selected public building projects. Overall, these risks not only delay procurement stages but also cascade in to project execution, undermining schedule adherence, escalating costs, and diminishing stakeholder confidence. Understanding and mitigating these risks is therefore essential for improving the timeliness and effectiveness of public institution building delivery in Edo State.

II. PROBLEM STATEMENT

Public building projects delivered by government agencies and public institutions in Edo State Nigeria, continue to suffer from significant delays and schedule overruns, undermining their intended social and economic benefits. Despite the existence of procurement regulations such as the federal public procurement act [7] and its domesticated version in Edo State that is Edo State Public Procurement Law [8]. The effectiveness of procurement processes remains weak in practice. However, a persistent and pervasive challenge facing these public institution buildings is time performance failures, manifested as delays beyond scheduled completion dates. These inefficiencies in time performance have been largely attributed to risk factors embedded within the procurement process that is the formal sequence through which goods, services, and works are acquired for project execution. The procurement process in public construction involves multiple interlinked stages including planning, specification development, tendering, evaluation, and contract award. In practice, each of these stages is vulnerable to a range of risks such as delays in approval of procurement documents, inadequate planning, documentation errors, and non-compliance with procurement regulations. Such risks contribute to extend lead times, disruptive project cycles, and missed milestones. For instance, regulatory and procedural rigidity, as well as slow bureaucratic responses in procurement lead to significant delays in acquiring required materials and engaging contractors, thereby undermine project schedules and

time performance. [6] state that Nigerian public procurement is characterized by inherent uncertainties and poor risk management in procurement practices significantly undermines public construction delivery performance.

These risk factors include corruption and lack of transparency, conflict of interest, ineffective technical feasibility assessments during procurement planning, and inappropriate procurement strategy selections, all of which erodes efficiency and contribute to schedule overruns [9]. While studies in other states of Nigeria such as Ondo State have shown that procurement risks significantly affect cost performance [10]. Similar links to time performance remain under-researched in the context of Edo States' public building projects. Despite the fact that delays not only escalate costs but also reduce the value of public of public investments and degrade users' confidence in institutional delivery, there is limited empirical evidence documenting how specific procurement risk factors influence project durations in Edo State. This gap underscores the urgent need for contextualized research that will quantify and explain the problem, enabling policymakers and project stakeholders to formulate risk-based strategies that enhance time performance outcomes in public institution building projects in Edo State.

III. LITERATURE REVIEW

The stages involved in the procurement process

Construction procurement is the process of identification, selection and commissioning of the contributions required for the delivery of alteration, refurbishment, maintenance, extension or demolition of an existing building or structure, and/or the creation of a new building or facility, including all associated site works [11]. The procurement process involves a wide range of skills for which training and development may be required. It is a process of identifying and obtaining goods, works and service. It includes sourcing, purchasing and covers all activities from identifying potential suppliers through to delivery from supplier to the users or beneficiary. Procurement process is the entire procurement cycle starting from the identification of need, through to the completion of the contract [12]. Procurement process is a series of operations or actions taken in order to achieve the intended aim of construction project procurement. The scope of construction procurement process covers every aspect of a project delivery system [13]. According to [13] procurement process involves initiation, preliminary, design and development, detailed design, contracts and procurement, manufacture and construction, commissioning, operation and maintenance. [14] identified five stages of procurement process: procurement planning and needs assessment, documentation and product design, tender and evaluation processes, contract award and execution, and auditing and accounting process.

Procurement process include: preparation of procurement plans, preparation of procurement specifications and initiation of the procurement process, preparation of pre-qualification/tender documents, advertisement/initiation of bids, receiving and opening bids, evaluation of bids, adjudication and contract award, notification of contract award, negotiations, preparation and signing of procurement contract, contract administration, receipt inspection and acceptance of goods, works, services and consulting services and storage and inventory management. [12, 15, 16] had a similar procurement process such as preparatory steps, prequalification of bidders, preparation of bidding documents, receipt of bids, and contract award. [2] identified the following procurement process- contract review and award, preparation and issuance of solicitation document, operational procurement planning, contract finalization and issuance, receipts and opening of offers, evaluation, selection of a procurement strategy, requirement of definition and sourcing.

[17] had a similar procurement process such as operational procurement planning, requirement definition, sourcing, selection of procurement strategy, preparation and issuance of solicitation document, receipt and opening of offers, evaluation, contract review and award, contract finalization and issuance, and contract management. [18] sets out six principal activities associated of a generic procurement process as follows: Establishment of what is to be procured, decision on procurement strategies in terms of contract, solicitation of tender

offers, evaluation of tender offers, award contract and administration of the contract and confirmation of compliance with requirements. [19] identify seven steps involved in the procurement process as: information gathering, supplier contact, background review, negotiation, fulfillment, consumption, maintenance, disposal and renewal. Furthermore, a generic procurement process involves project identification and procurement planning, contractor registration and prequalification, tendering process, bid submission and opening, bid evaluation and recommendation, contract award and approval, contract implementation and execution and contract completion and closeout [20, 21]..

Risk factors associated with procurement process

Procurement process risk refers to uncertainties in the acquisition of goods and services that can adversely affect an organization's financial performance, operational efficiency, legal compliance, and reputational standing. Risk in the procurement process is an event that may impact on adequacy, compliance and continuity of procurement process that support the procurement activity. Risk is a complex phenomenon that has physical, monetary, cultural and social dimension. Risk is the probability of occurrence of uncertain, unpredictable and even undesirable events that would change the projects for the probability on a given investment. . Project in controlled environment describes risk as the chance of exposure to the adverse consequences of future events [22]. Risk exists when decision is expressed in terms of a range of possible outcomes and when known probabilities can be attached to the outcomes. A Procurement process risk is a variable in the process of Procurement whose occurrence results in uncertainty as to the final cost, duration and/or the quality of the project.

The procurement process involves a wide range of skills for which training and development may be required. Risks in construction procurement process have been considered in relation to the separation of design from construction, lack of integration, poor communication, uncertainty, changing environment and economic changes such as inflation and deflation, regional economic crisis [12]. [16] identified the specific risks and issues that may be encountered in procurement process. Such as understatement of the need, overstatement of the need, inadequate information, insufficient funding, actual or perceive breach of confidentiality, failure to follow effective evaluation procedures, unauthorized increase in scope of work, insufficient numbers of responses, fraud and corruption, and failure of evaluation to identify a clear winner. Others are impractical time frame, inadequately administering the contract, poor quality of works, lack of technical know-how by consultants, failure of either party to fulfill the conditions of the contract, terms and conditions unacceptable to tenderers and variation in price and foreign exchange. These risk factors have likely consequence of no improvement in the procurement management process and possibility of failure in future procurement processes respectively. Recent literature highlights that procurement process risks is multidimensional, encompassing supplier, market, operational, construction, compliance and technological vulnerabilities that arise across the generic procurement cycle. These risks include inconsistent quality, price volatility and economic uncertainty, inadequate internal processes, poor forecasting, and manual workflows, inadequate compliance controls, legal, regulatory breaches [23, 24].

Mitigation strategies

Risk factors in public construction procurement including delays in contract awards, inadequate planning, and compliance failures have a direct negative impact on project time performance in public institutions. Effective mitigation aims to reduce delays, enhance transparency, and ensure efficient delivery of building projects on schedule is very important. Such mitigation strategies include comprehensive planning and risk assessment. According to [25] effective procurement planning that includes risk assessment is foundational. Early identification of risks such as unclear requirements, unrealistic time schedules, or insufficient market analysis enables proactive mitigation rather than reactive responses. Risk profiling and classification like time, cost, and quality helps project teams anticipate and prioritize threats to schedule performance. Practical actions include undertaking needs assessments and detailed scope definitions

before tendering, developing formal risk registers and conducting risk probability or impact analyses, and linking procurement timelines to milestone commitments within project schedules. Establishing a governance structure for procurement risk management at organizational and national levels promotes accountability and reduces systematic causes of delay. Frameworks should include defined roles, escalation mechanisms, compliance checks, and risk monitoring protocols throughout the procurement cycle. These mechanisms include a central authority for procurement risk oversight, standardized risk management policies across departments and scheduled audits and compliance reviews [26]. Others include promoting ethical procurement practices and transparency, continuous monitoring and feedback, digitalization and technology adoption and supplier engagement and contract strategies.

IV. MATERIALS AND METHODS

The study employed a survey design for the collection of the required data. The data was collected through the use of well- structured questionnaire. This study involved institutional building projects carried out between 2015 and 2025 at Auchi Polytechnic, University of Benin and Ambrose Ali University, Ekpoma, as well as construction professionals and contractors involved in the selected projects. The three higher institutions were selected for this study because they are among the major public higher institutions in Edo State with extensive physical infrastructure and continuous development of institutional building projects over the years. The selected building projects were chosen because they were executed within the study period and involved formal procurement procedures. These projects represent typical institutional building projects such as academic buildings, administrative blocks and related facilities commonly undertaken by public higher institutions. In addition, the projects involved key construction professionals and contractors who had direct experience with the procurement process, making them suitable for providing reliable information on procurement risks and practices. The availability of project records and accessibility to respondents also informed the selection of the projects. The findings from pilot survey show the number of construction professionals and contractors namely Architects, Quantity Surveyors, Civil Engineers, and Builders involved in the projects was one hundred and seventy seven (177). A random sampling technique was used for the study. For the purpose of this study, data were collected using well-structured questionnaires administered to identified construction professionals and contractors who had been involved in the building projects. The questionnaire was in two sections; the preliminary section of the questionnaire dwelt on the background information of the respondents while the other section focused on matters relating to the research objectives. Questions inherent in the structured questionnaire were multiple-choice type with different checkboxes and tables posed on a 5-point Likert scale for ease and uniformity of response. Its application implies that most part of the data analysis was based on a scoring system. Out of 177 questionnaires administered, only one hundred and thirty three (133) were considered suitable for analysis which represented a healthy return rate of seventy five percent (75%). Data were collected over a six week period using both online and print copies of the questionnaire to accommodate respondents' preferences. Follow ups and reminders were sent to improve response rates. To ensure the reliability and validity of the research instrument, a pilot study was conducted among a small group of construction professionals who were not part of the final survey. Feedback obtained from the pilot test was used to refine the questionnaire.

Content validity was also ensured through expert review by academics and construction professionals with expertise in procurement and risk management.Tables were employed in this research for data presentations. The analysis of the collected data was carried out using the following descriptive and analytical scientific methods; percentile, mean item score, and multiple linear regression analysis. The background information of the respondents was analysed using percentiles while mean Item Score (MIS) was used to analyse identified stages involved in the procurement processes and risks associated with procurement process and multiple linear regression analysis was used to analyze impact of identified risk factors on time performance of institutional building projects.

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Mean item score (MIS)
Mean score was used to rank the risks associated with procurement process. The premise of decision for the ranking is that the factor with the highest mean item score is ranked 1st and others in such subsequent descending order.

The formula for mean score is = $\frac{\sum (FX)}{N}$

Where X is the rating used per column
F is the sample size for each rating and
N is the total sample size.

Since a Likert of 5-point scale was employed for the collection of data, the formula can thus be written as

$$\text{Mean Score} = \frac{5F_5 + 4F_4 + 3F_3 + 2F_2 + F_1}{N}$$

The basis of determination of level of importance of procurement process and risks associated with procurement process using mean item score was on this premise:

$1.00 < MIS \leq 1.99$: Not important
$2.00 < MIS \leq 2.99$: Fairly Important
$3.00 < MIS \leq 3.99$: Moderately important
$4.00 < MIS \leq 4.89$: Important
$4.90 < MIS \leq 5.00$: Very important

Regression analysis
Regression analysis is a predictive approach. It is a statistical method to predict the changes in the dependent variable based on several independent variables. Regression analysis is the statistical technique for determining the relationship between two or more variables. Regression determines the nature or direction, extent or degree and casual relationship between variables. The case where one variable, called the dependent variable, depends on only one other variable. In this study, multiple-linear regression analysis models were used to determine the direction and degree of the impact of these risk factors on time performance of public institution building projects in Edo State. The significant risk factors were used as independent variables, while time performance was used as dependent variables. The basic relationship between the independent variable, represented by X, and the dependent variable, represented by Y is expressed in a mathematical equation given as:

$$Y = \alpha + ß1x1 + ß2x2 + ß3x3 + \ldots + ßnxn + e$$

Where;
Y is the dependent variable or quantity being predicted,
X1, x2, x3….. xn = Independent variables
ßo : Intercept (value of Y when all X's are zero
ß1, ß2…. ßn; Coefficients (effects of each X and Y
e = Error term

X is the independent variable, the value of Y when X =0, i.e. the intercept of the y-axis- The slope or gradient. It measures the degree or impact of relationship between the two variables, i.e. it estimates the degree or magnitude of change in Y for a unit change in X. It is positive for direct and negative for inverse relationships

V. RESULTS AND DISCUSSION

Demographic information of the respondents
Table 1 summarizes the demographic of the respondents. It shows that majority of the respondents 63 (47.4%) participated in survey were Consultants, followed by Contractors and Public Clients with 36 (27.1%) and 28(21.1%) respectively. Result also shows that 38 (28.6%) of the repondents were Engineers, 35 (26.3%) were Builders, 34 (25.6%) were Quantity Surveyors while 23 (17.3%) were Architects. Table 4 shows that all the respondents were affiliated to relevant professional bodies in their respective professions. Out of which 91.5% of them have attained corporate membership grade while 17.5 % of the respondents were graduate/probationer members of their respective professional bodies.

It shows that they are capable to provide vital information on the objectives of this research. Analysis inTable 1 reveals that 55 (41.7%) 35 (26.5%) and 25 (18.9%) of the respondents had M.Sc/M.Tech, B.Sc/ B. Tech and PGD degrees respectively. About 11.4% (15) were HND holders,

while 1.5% (2) have PhD. Therefore, the respondents are considered adequate and reliable for this research. It is evident from table 2 that respondents have about 11years'experience in the construction industry. It can therefore be concluded that the data provided by respondents can be relied upon for the purpose of analysis.

Table1 Summary of demographic information of the respondents

Category	Classification	Frequency	Percent
Type of Organization	Public client	28	21.1
	Consultant	63	47.4
	Contractor	36	27.1
	Private client	3	2.3
	Others specify	3	2.3
	Total	133	100.0
Profession of Respondent	Quantity surveyor	34	25.6
	Architect	23	17.3
	Builder	35	26.3
	Engineer	38	28.6
	Others specify	3	2.3
	Total	133	100.0
Professional body of affiliation	NIA	28	21.1
	NIQS	31	23.3
	NIOB	31	23.3
	NSE/COREN	37	27.8
	Others	6	4.5
	Total	133	100.0
Professional membership Type	Graduate/Probationer	22	16.5
	Corporate	111	83.5
	Fellow	0	0.0
Total		133	100.0
		Frequency	Percent
Highest academic Qualification of respondent	HND	15	11.3
	B.sc/B.Tech	35	26.3
	PGD	25	18.8
	M.sc/M.Tech/M.Eng	55	41.4
	Phd	3	2.3
	Total	133	100.0
Years of working Experience	1-5 years	24	18.1
	6-10 years	43	32.3
	11-15 years	42	31.6
	16-20 years	14	10.5
	Over 20 years	10	7.5
	Total	133	100.0
	Average	11	

The stages involved in the procurement process

Table 2 presents the stages involved in the procurement process. The results from Table 2 indicate that respondents perceive the preparation of bidding documents and evaluation criteria as the most important stage of the procurement process, with the highest mean item score of 4.71. This is closely followed by bid evaluation with a mean item score of 4.52, contract review and award with a mean item score of 4.47, and contract management with a mean item score of 4.26. The high mean scores for these processes suggest they are considered critical stages within the procurement cycle, particularly due to their strong influence on decision making, transparency, and the timely execution of public institutional building projects. In contrast, contract finalization and issuance and commissioning with mean item scores of 3.77 and 3.66 recorded the lowest mean item scores, indicating that respondents perceive them as relatively less critical compared to earlier and middle stage procurement activities. This may be because delays and risks affecting time performance are more likely to originate during the planning, evaluation, and contract administration stages rather than at the closing phases of the procurement process. The average mean score of 4.13, which is above the benchmark value, demonstrates that procurement processes are generally regarded as important in influencing project outcomes. Overall, the findings imply that greater attention and resources should be directed toward the early and core procurement stages, as weaknesses in these areas are more likely to result in delays and poor time performance in public institutional building projects. The results align with the studies of [27] who confirm that bid preparation and evaluation are central to effective procurement. Clear bid documents and evaluation criteria are essential for transparency, fairness, and selecting the best contractor. Poorly drafted documents lead to ambiguity, delays, or disputes later in the process. Contract review and award and contract management reflect recognition that once a contractor is selected, formalizing and successfully managing the contractual relationship are essential for delivering the goods or services as agreed. Contract management is widely recognized as critical in ensuring performance, compliance, and value delivery over the contract life cycle. This result

was in conformity to the submission of [28] that preparation of bidding documents and evaluation criteria, evaluation and contract review were the essential stages in the procurement process.

Table 2: The stages involved in the procurement process

Code	Identified procurement process	Mean	Ranking
IPP8	Preparation of bidding documents and evaluation criteria	4.71	1st
IPP10	Bid evaluation	4.52	2nd
IPP7	Contract review and award	4.44	3rd
IPP4	Contract management	4.26	4th
IPP1	Receipt and opening of offers	4.21	5th
IPP2	Requirement definition	4.06	6th
IPP5	Selection of procurement strategy	3.88	7th
IPP9	Operational procurement planning	3.80	8th
IPP3	Contract finalization and issuance	3.77	9th
IPP6	Commissioning	3.66	10th
	Average mean	4.13	

3.3 Risk factors associated with the procurement process

Table 3 displays the results of the risk factors associated with the procurement process. It can be seen from Table 3 that the most frequently occurring risks are fraud and corruption with a mean item score of 4.52. Next to this is probity/integrity/ethical issues with a mean score of 4.44, the analysis also revealed that fluctuation in currency and high interest rate as the 3rd factor with a mean score of 4.18, this is followed by insufficient funding with a mean score of 4.05. While among other risk factors, failure to observe effective evaluation procedures ranked 5th with a mean item score of 3.96. The least ranked is key personnel not available with a mean score of 2.63. Fraud and corruption are the most frequently occurring risks align strongly with global empirical evidence. Fraud and corruption are widely reported as pervasive challenges in public procurement, causing inefficiency, cost inflation and misuse of public funds. [29] identified that fraud, corruption, and collusion as the most common crime in public procurement, affecting cost, time, quality, competition, and trust. Corruption risk is especially highlighted in procurement literature because of the high stakes and complex interactions between public officials and private contractors or suppliers, making it one of the top integrity risks across procurement stages. Closely linked to fraud, ethical lapses and lack of integrity are consistently identified as critical threats to procurement quality and fairness. Procurement integrity risks include favouritism, conflict of interest, and unethical conduct by officials and contractors. [30] reinforce that weak ethical practices erode transparency and quality decision making. Policies that foster ethical governance, such as integrity pacts and whistleblower mechanisms, are increasingly recommended to reduce corruption and enhance accountability. [24] confirms that financial risks such as budget constraints, price volatility, and fluctuating currency rates undermines procurement planning and execution, affecting contract costs and supplier viability. Inadequate evaluation procedures create opportunities for unfair contractor selection, delay processes, and reduce value for money. Failure to follow rigorous evaluation undermines competitive bidding and increases exposure to fraud and poor performance. This finding corroborates the work of [31] who reported that fraud/corruption, probity/integrity/ethical issues are becoming an increasing common problem globally as most construction fraud and corruption cases are somehow linked to the procurement process.

Table 3 Risk factors associated with the procurement process

Code	Identified risk factors	Mean	Rank
RPP4	Fraud and corruption	4.52	1st
RPP7	Probity/Integrity/Ethical issues	4.44	2nd
RPP30	Fluctuations in currency and high interest rates	4.18	3rd

RPP25	Insufficient funding	4.05	4th
RPP18	Failure to observe effective evaluation procedures	3.96	5th
RPP1	Use of inappropriate evaluation criteria	3.85	6th
RPP9	Failure of either party to fulfill the conditions of the contract	3.82	7th
RPP11	Selection of inappropriate procurement strategy planning	3.78	8th
RPP13	Delays in obtaining approvals	3.71	9th
RPP15	Inadequate tender management	3.66	10th
RPP22	Provision of inadequate information	3.52	11th
RPP17	Biased specifications	3.47	12th
RPP14	Failure of evaluation to identify a clear winner leading to subjective discussions or development of new criteria	3.43	13th
RPP24	Selection of inappropriate contractor/supplier	3.40	14th
RPP28	Failure to adequately address requests for clarifications from bidders	3.34	15th
RPP33	Actual or perceived favoritism in providing information	3.30	16th
RPP35	Impractical time frame	3.27	17th
RPP5	Failure of offers to meet project needs	3.22	18th
RPP10	Inadequately administering the contract	3.18	19th
RPP19	Lack of independent and trustworthy references of bidders	3.09	20th
RPP20	Lack of clarity about legal framework and restriction	3.07	21st
RPP27	Actual or perceived breach of confidentiality	3.04	22nd
RPP34	Failure to reflect the terms offered and agreed in the contract	3.02	23rd
RPP31	Bid collusion	3.01	24th
RPP29	Selection of inappropriate consultant team	2.99	25th
RPP23	Unauthorized increase in scope of work	2.92	26th
RPP21	Lack of past performance consideration	2.89	27th
RPP16	Unfair or Onerous requirements on the bidders in the contract conditions	2.85	28th
RPP1	Conflict with existing contracts/ supply arrangement	2.80	29th
RPP8	Deadlock on details of agreement	2.79	30th
RPP12	Insufficient number of responses	2.77	31st
RPP6	Terms and conditions unacceptable to bidders	2.74	32nd
RPP3	Unacceptable requirements to suppliers	2.70	33rd
RPP2	Justification for single source procurement is inadequate	2.64	34th
RPP26	Key personnel not available	2.63	35th

Impact of risk factors associated with the procurement process on time performance

One of the study objectives is to construct a predictive model that will determine the impact of risk factors associated with the procurement process on time performance of construction projects. To achieve the above objective, a linear regression model was specified using risks associated with procurement process as independent variable and time performance as dependent variable.

Model fit summary of regression analysis on the impact of risk factors on time performance

Table 4 presents the model fit summary of regression analysis on the impact of risk factors on time performance. From Table 4, R was 0.821, this is the multiple correlation coefficients and it indicates a strong positive relationship between the combined risk factors and time performance. The R-square for the model was .674 which implies that the Risks Associated with Procurement Process (RAPP) explained about 67.4% of the variance in time performance. Thus, the remaining 32.6% is due to other factors and residuals. Also, the multiple R (R=

.821) revealed a significant high relationship between independent variable (Risks Associated with Procurement Process (RAPP)) and dependent variable (Time performance). Adjusted R^2 was 0.664; it shows that after adjusting for model complexity, 66.4% of the variance in Time performance is still explained by the risk factors. F-statistic tests the overall significance of the model.

Table 4: Model fit summary of regression analysis

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.821[a]	0.674	0.664	0.17555

a. Predictors: (Constant), TIP, RAPP

ANOVA results for the impact of risk factors on time performance

Table 5 shows the ANOVA results of the linear model assessing the impact of risk factors on time performance. In order to improve the model by fitting the regression model, the value of F-ratio must be greater than 1 (the exact probability of obtaining the value of F by chance). From Table 5, the F value was 68.202, which was highly significant (P= 0.000, p= < 0.001). This shows that the model was valid. Thus, based on the findings it can be concluded that there was a linear relationship between the predictors (Risks Associated with Procurement Process (RAPP)) and time performance of institution building projects in Edo State.

Table 5 ANOVA results for the impact of risk factors on time performance

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	2.102	1	2.102	68.202	.000[b]
	Residual	1.017	33	.031		
	Total	3.119	34			

a. Dependent Variable: Time Performance
b. Prediction: (Constant) Risk Associated with Procurement Process

Regression coefficients for the impact of risk factors on time performance

Table 6 displays regression coefficients for the impact of risk factors on time performance. In comparing the contribution of independent variable (Risks Associated with Procurement Process (RAPP)), Beta values are used as illustrated in the standardized coefficient column, Risks Associated with Procurement Process (RAPP) makes the very strong unique and positive contribution to explaining time performance with (β= 0.811) for construction project in Edo State. The outcome of the result indicates that increase in the impact of Risks Associated with Procurement Process (RAPP) will increase time performance of institutional building projects in Edo State. The independent variable has a strong, statistically significant and positive influence on time performance. Based on the regression analysis, the model consists of one predicting variable namely: Risks Associated with Procurement Process (RAPP) (χ1). Thus, the prediction equation of the for time performance model is as follows:

$\hat{Y} = a+\beta 0+\beta\ 1\chi 1 + ei$….. (1)
$Y = 0.822 + 0.811x$

Where:
$\hat{Y}$ = (the dependent variable) Time performance
a = the intercept / regression constant
β =the slope, or regression coefficient of each variables.
χ1= Risks Associated with Procurement Process (RAPP)
ei= Error terms assumed to have zero mean and constant variables

Table 6 Regression coefficients for the impact risk factors on time performance

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.822	.346		2.376	.023
	Risk impact of procurement	.811	.098	.821	8.258	.000

a. Dependent Variable Time Performance

Mitigating strategies for risk factors associated with the procurement process

Table 7 presents mitigating strategies for risk factors associated with the procurement process.The results indicate that respondents strongly prioritized upstream, preventive risk mitigation strategies over downstream, corrective measures in managing procurement process risks affecting the time

performance of public institution building projects. This is evidenced by the higher mean item scores recorded for comprehensive procurement planning and early risk assessment with a mean item score of 4.51, institutional and governance frameworks with a mean item score of 4.21 and development of formal risk registers with risk probability analysis with a mean item scores of 4.13. In contrast, continuous monitoring and feedback loops, contract clauses for liquidated damages and supplier due diligence with mean item scores of 3.78, 3.71 and 3.68 were ranked lower. The highest mean scores recorded for comprehensive procurement planning and early risk assessment suggests that stakeholders perceive early stage interventions as the most effective means of preventing procurement delays. This finding aligns with studies of [32] which consistently identify inadequate planning as a principal cause of time overruns in public construction projects. Furthermore, studies on construction procurement consistently show that inadequate planning and early risk management are among the leading causes of schedule delays, reinforcing that front loaded risk mitigation reduces the likelihood of schedule slippage later in the project life cycle [33]. The strong rating of this strategy supports the argument that most time related procurement risks originate during the pre-contract phase and are best mitigated before tendering commences. Similarly, the high ranking of institutional and governance frameworks underscores the importance of clear regulatory structures, define roles, and compliance mechanisms in public sector procurement. The relatively high mean score for formal risk registers and risk probability analysis further confirms the growing recognition of systematic risk management practices in public procurement. The result suggests that respondents acknowledge structured risk management tools as essential for anticipating procurement related disruption. Overall, the findings demonstrate a clear preference for preventive and system level strategies over corrective and enforcement based measures in procurement process risks affecting time performance. This pattern is consistent with previous studies, which conclude that early planning, strong governance, and structured risk assessment have a greater influence on timely project delivery than post contract controls. The result reinforce the notion that improving procurement outcomes in public institution building projects requires strengthening institutional capacity and front-end decision making rather than relying solely on contractual sanctions or monitoring mechanisms.

Table7 Mitigating strategies for risk factors associated with the procurement process

Code	Identified risk strategies	Mean	Ranking
PRM10	Comprehensive procurement planning and early risk assessment	4.45	1st
PRM7	Institutional and governance frameworks	4.21	2nd
PRM6	Developing formal risk registers and conducting risk probability	4.13	3rd
PRM9	Performance based contracts	3.96	4th
PRM2	Linking procurement timelines to milestone commitments within project schedule	3.87	5th
PRM8	Digitalization and technology adoption	3.84	6th
PRM4	Transparency, ethics and stakeholder involvement	3.80	7th
PRM1	Continuous monitoring and feedback loops	3.78	8th
PRM5	Contract clauses for liquidated damages	3.71	9th
PRM3	Supplier due diligence	3.68	10th

VI. CONCLUSIONS

The study examined the impact of risk factors associated with the procurement process on the time performance of public institutional building projects in Edo State. The findings reveal that risks in procurement process significantly affect project delivery timelines. Key risk factors such as inadequate procurement planning, delays in approval processes, unclear bidding document, fraud, corruption, integrity issue, poor contractor selection, funding constraints and bureaucratic procedures were found to contribute substantially to time overruns in public institutional building projects. The study further establishes that weaknesses in risk identification and management during the procurement stages especially during bidding, bid evaluation, and contract award often result in delayed project commencement and execution. The study reveals that preparation of clear bidding documents and the evaluation of bids are the most important stages of procurement process. The outcome of the

results indicates that independent variable, namely risk factors, has a strong, positive, and statistically significant influence on time performance. In conclusion, effective management of procurement process risks is critical to improving the timely delivery of public institutional building projects in Edo State. Strengthening procurement planning, enhancing transparency and accountability, adopting robust risk assessment mechanisms and enhancing adherence to established procurement guidelines will significantly reduce time overruns and improve project performance. These measures are essential for achieving value for money and enhancing the efficiency of public sector construction project delivery. Government, ministries, departments and agencies in Edo State should enforce comprehensive procurement planning at early stages of public institutional building projects. Detailed project scopes, realistic timelines, and risk assessments should be mandatory before project approval to minimize delays.

VII. IMPLICATIONS OF THE STUDY

The study deepens theoretical understanding of how risk factors associated with procurement process such as poor contract planning, corruption, and bureaucracy specifically influence project time performance, expanding from general risk literature to process specific effects. There is limited research on procurement risks specifically in Edo State's public institutional construction sector; this study adds empirical evidence in a less explored context. Evidence that certain procurement risks cause delays will push Edo State agencies to revise procurement regulations for faster procedures specifically around prequalification and tender evaluation. Furthermore, training procurement officers on risk management, contract administration, and schedule control improves performance and insights on high risk procurement stages allow better project budgeting for time contingencies and cash flow planning.

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