

Building Project Schedule Overruns: Evaluation of Causative Factors in Rivers State, Nigeria ¹

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ABSTRACT

The study evaluates the causative factors for building projects schedule overrun in Rivers State. Understanding the causes, effects and mitigation strategies for schedule overruns is critical for project managers aiming to deliver projects on time and within budget. Thus, the purpose of this present study is proffer strategic approaches to mitigating the risk and impact of schedule overruns, throughout the project lifecycle. With questionnaire, a sample of 127 individuals comprising of Architects; Civil engineering consultant; Project managers and Project developers/owners resident in Port Harcourt city, Oyingbo, Ikwerre and Elele Local Government Areas of Rivers State; were analyzed using the Pearson's correlation and One Sample t-test statistics at $p < 0.05$; the result showed that resource efficiency ($\alpha = 14.379$), inadequate risk management ($\alpha = 8.937$); Scope creep ($\alpha = 8.924$) and poor planning and estimation ($\alpha = 7.104$) are significant factors that strongly cause schedule overruns in the delivery of building project. The study found that these factors affect the process of constructing a building structure; across its stages and requires the involvement of building experts in order to moderate their negative impact. The study concludes that proper resources planning; duration estimation and schedule development and control are very important for ensuring efficient time management in building project delivery in Rivers State. The researcher recommends that clear requirements definition, stakeholder engagement, robust change control processes, realistic planning, and leveraging technology are very crucial in addressing the challenge of scope creep and ensuring successful project completion on time and within budget.

Keywords: *Building projects, Schedule overrun, project delivery, resource efficiency. Risk management, Rivers State.*

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1.0 Introduction

Building projects are pivotal to urban development infrastructure growth, and economic progress. These projects range from residential homes to large commercial complexes, industrial facilities and essential public infrastructure. As posited by Schwalbe (2020), each building project is unique, requiring meticulous planning, skilled labour, financial resources and effective project management to ensure its success.

However, project scheduling is crucial for managing project timelines. Tools such as Gantt charts, critical path method (CPM) and software like Microsoft project or primavera P6 are used to track milestones and deadlines. A schedule overrun occurs when a project exceeds its initially planned timeline. It is a widespread issue across industries such as construction, software development, healthcare, and event management that schedule overruns can have far-reaching consequences on cost, resource management, and overall project success. Understanding the causes, effects and mitigation strategies for schedule overruns is critical for project managers aiming to deliver projects on time and within budget.

Most authors have highlighted common causes of schedule overruns which include; poor planning and estimation (Flanagan, 2021) scope creep (Schwalbe, 2020), resource constraints (Lichtenstein & Everliart (2022), inadequate Risk Management (Paul, 2021), unrealistic deadline (Global project management report (2021), communication breakdowns (de Silva & Wickramasinghe, 2021) and External Factors (Huang 2021).

Schedule overruns are not just about missed deadlines; they can lead to a cascade of negative consequences. Schedule overruns remain a common challenge in project management across various industries. However, through careful planning, proactive risk management, effective communication and the use of modern tools and methodologies, these overruns can be minimized. According to the Project Management Institute (PMI) 2020. Global Survey, sixty percent (60%) of projects that experienced schedule delays also encountered a corresponding rise in costs. When deadlines are missed, there is often pressure to accelerate work, which can lead to compromises in quality. Rushed work may result in defects, errors, and the need for rework, all of which can further delay the project. A study by Nguyen (2020) showed that projects with significant schedule delays tend to experience a higher rate of quality issues, especially in construction and engineering projects. Again, repeated delays can damage the reputation of a company or project team. Clients may lose trusts in the organization's ability to meet deadlines, potentially leading to a loss of future contracts or business. The delayed rollout of a public service project may cause long-term reputational damage to the responsible government body (Dixan & Armitage, 2022).

Again, schedule overruns typically result in frustration for stakeholders, including clients, team members and other involved parties. Negative experiences stemming from missed deadlines can affect client relationships, decrease investor confidence, and harm employed moral.

A report by PWC (2020) noted that 45% of project stakeholders reported dissatisfaction due to missed deadlines in major infrastructure projects. Extended schedules often lead to team fatigue, stress and burnout. As deadlines shift; team members may feel de-motivated or disengaged, which can decrease productivity and create additional delay. Research by Zahran (2022) indicates that projects with prolonged schedules experience a 25% reduction in team work, leading to lower output and increased likelihood of errors. Thus, in order to mitigate the risk and impact of schedule overruns, project managers, must strategically approaches throughout the project lifecycle; hence this study investigates core causative factors of building project schedule overruns with the intention of recommending possible remedies to those causes in the study area.

The specific objectives include:

- i. To determine the effect of poor planning on building projects schedule overrun in Rivers State,
- ii. To ascertain the effect of scope creep on building project schedule overrun in Rivers State,
- iii. To determine the effects of inadequate risk management on building project schedule overrun in Rivers State,
- iv. To determine the effects of resource efficiency on building project schedule overrun in Rivers State,

In line with the study objectives, the following research hypotheses were formulated for testing;

- H₀₁:** There is no significant relationship between poor planning and building project schedule overrun in Rivers State.
- H₀₂:** There is no significant relationship between scope creep and building project schedule overrun in Rivers State.
- H₀₃:** There is no significant relationship between inadequate risk management and building project schedule overruns in Rivers State
- H₀₄:** There is no significant relationship between resource efficiency and building project schedule overruns in Rivers State

The study concentrated around some selected building projects in some local governments in River State. This is to ensure that the subject matter is duly addressed.

The scope of the study is looked at from the content scope, geographical scope and unit scope.

The content scope of the study involves looking at the issue of building project schedule overrun. It confines itself to the relationship between independent variables or causative factors namely poor planning, scope creep, inadequate risk management and resource efficiency; on the one hand and the dependent or response variable namely building projects schedule overrun.

The geographical scope considers the location of the building projects involved and our concentration is on selected local government areas and these include Port Harcourt city, Oyingbo, Ikwerre and Elele Local Government Area in River State.

The unit scope considers the organizational units of analysis which include majorly the participants in the building industry such as architects, engineers, quantity surveyors, estate surveyors, builders and team planners.

2.0 Conceptual Review

A schedule overrun occurs when a project exceeds its initially planned timeline. It is a widespread issue across industries such as construction, software development, healthcare and event management schedule overruns can have far-reaching consequence on cost, resource management and overall project success. Understanding the causes, effect and mitigation strategies for schedule overruns is critical for project managers aiming to deliver projects on time and within budget.

Schedule overruns arise due to various factors, often intentioned, that can be categorized into internal project management issues, external factors, or both

a.) Poor Planning and estimation: Inaccurate task estimation and failure to account for all projects complexities often lead to schedule overruns. A lack of detailed planning or improper resources allocation results in underestimating the time required for task. According to Planagan (2021), poor upfront planning is one of the leading causes of delays in large construction projects.

b.) Scope Creep: Scope creep refers to uncontrolled changes or continuous growth in a projects scope without adjustments to the project timeline, budget or resources. These changes, whether requested by the client or due to internal revisions, can significantly extend the projects duration. As noted by Schwalbe (2020), scope creep remains a persistent problem in many industries and is a direct cause of schedule overruns.

c.) Resource Constraints: The availability and management of resources (personnel, equipment or materials) play a crucial role in adhering to project timelines. Resource conflicts, shortages or delays in the procurement of materials often lead to setbacks. A study by

Licktenstein and Everhart (2022) highlighted that more than 40% of project delays in the construction sector were related to resource allocation issues.

d.) Inadequate Risk Management: Unanticipated risks such as equipment failure, regulatory changes or natural disasters can disrupt the project schedule. Failure to predict and initiate risks early in the project lifecycle can lead to significant delays. According to Pull (2021) projects that lack effective risk management plans are 30% more likely to experience schedule overruns.

e.) Unrealistic Deadlines: Setting overly optimistic timelines without proper consideration for the scope, resources and complexities of tasks often results in schedule overruns. According to the Global Project Management Report (2021), unrealistic deadlines are a common source of delay, especially in client-driven projects that require a fast turnaround.

f.) Communication Breakdowns: Effective communication between stakeholders, team members, and external vendors is essential for timely project execution. Miscommunication can lead to errors, delays and misaligned expectations. Research by de Silva and Wickramasinghe (2021) found that projects with poor communication practices are twice as likely to experience significant schedule overrun.

External Factors

Factors such as changes in regulations, economic conditions, labour strikes, or supply chain disruptions can also contribute to schedule overruns. For instance, the Covid-19 pandemic caused significant delays in manufacturing and construction projects worldwide, as noted by Huaug et al (2021).

2.1. Effects of Schedule Overrun

Schedule overruns are not just about missed deadlines; they can lead to a cascade of negative consequences which include:

a.) Increased Costs: As the timeline extends, so do the costs prolonged project timelines mean additional labour costs, extended equipment rental periods, and increased operational overheads. According to the Project Management Institute (PMI) 2020 Global Survey, 60% of projects that experienced schedule delays also encountered a corresponding rise in costs.

b.) Compromised Quality: When deadlines are missed, there is often pressure to accelerate work, which can lead to compromised quality. Rushed work may result in defects, errors and the need for rework and of which can further delay the project. A study by Nguyen (2020) showed

that projects with significant schedule delays tend to experience a higher rate of quality issues, especially in construction and engineering projects.

c.) Damaged Reputation: Repeated delays can damage the reputation of a company or project team. Clients may lose trust in the organization's ability to meet deadlines, potentially leading to a loss of future contracts or business. For example, the delayed completion of a public service project in 2021 caused long-term reputational damage to the responsible government body (Dixon and Armitage, 2022).

d.) Decreased Stakeholder Satisfaction: Delays typically result in frustration for stakeholders, including clients, team members, and other involved parties. Negative experiences stemming from missed deadlines can affect client relationships, decrease investor confidence, and harm employee morale. A report by PWC (2020) noted that 45% of project stakeholders reported dissatisfaction due to missed deadlines in major infrastructure projects.

e.) Reduced Team Morale: Extended schedules often lead to team fatigue, stress, and burnout. As deadlines loom, team members may feel de-motivated or disengaged, which can decrease productivity and create additional delays. Research by Zahran (2022) indicates that projects with prolonged schedules experience a 25% reduction in team morale, leading to lower output and increased likelihood of errors.

2.2 Empirical Review

Many related authors have made various contributions on project schedule. Among the reviewed articles are; Akubo, Mbaonu, Anyanwu, Okorochoa and Dike (2024) assessed the impact of schedule overruns on the cost of building construction projects in tertiary institutions in Nigeria. The objective was to assess the magnitude of schedule overruns and their effects on the ultimate cost and quality of building construction project delivery. The research adopted the mixed-method methodology comprising of a descriptive survey and exploratory design; using the purposive, convenience and consistent sampling to obtain a sample size of 243 from a population of 6 federal universities in Nigeria, North central zone, with frequency distribution tables and charts generated through IBM SPSS 260 content analysis, utilizing performance data analysis was examined. The study's findings reveal that among thirty (30) building construction projects analyzed, twenty-nine (29) experience schedule overruns ranging from 75% to 230%, while one did not. Thirty (30) building projects were completed within budget, although the average cost overruns escalated in twenty-nine (29) of the evaluated construction projects. Remarkably, fewer than 50% of the 30-building construction projects that were finished under budget had a cost variance between their initially estimated cost and their actual completed cost. The variance resulted from increasing labour cost, rework and overall inefficiency in material management. This led to extended project

timeline. The study suggested continuous monitoring and practice management especially in project plan adjustment to accommodate budget constraint.

Koirala and Shahi (2024) examined the causes and effects of time overruns in construction project promoted by rural municipalities in Nepal, the goal of this study is to understand the causes and effects of time overruns by employing an exploratory and descriptive research methodology, the data from clients, consultants and contractors consistently highlights key factors contributing to project delays, including adverse weather conditions, limited involvement from contractor head office, insufficient consultant experience, inadequate site management and delays on site mobilization. These delays incur substantial costs related to materials, land acquisition, labour and market risks. The results included that 52.17%, of the projects experienced time overrun ranging from 24.4% to 514.7. Furthermore 21.73% of projects experienced cost overruns, with the highest at 19.92%. These findings provide critical insights for improving project management and addressing construction time overruns. It recommends conducting materials-scale analyses to gain a comprehensive understanding of construction delays and to implement effective mitigation strategies.

Bagale, and Bohara, (2024) conducted a study on eleven (11) recently completed ward office building construction projects; to evaluate the time, cost overrun, time-cost relationship and to identify and evaluate the major factors affecting the performance of building construction projects in Bharatpur metropolitan city. A questionnaire survey involving 61 identified factors categorized into 9 groups was conducted, validated through the Content Validity test, Criterion Validity test and Cronbach's Alpha tests. Using the Spearman rank correlation (ρ), the study found that all 11 building construction projects experienced time overruns, ranging from 28% to 150% beyond the contract time. Analysis using Relative Importance Index (RII) determined that the most significant factors, agreed upon by all stakeholders, included project manager leadership skills, materials price escalation, average delay because of closure and materials shortage, design and drawing changes, subcontractor control, organization liquidity and delayed payments of Relative Importance Index (RII) ranging from 0.513 to 0.925., there is a significant agreement between the ranking of Client, consultant and contractor.

Ikwueze and Nnadi (2024) conducted a study on impact of Project Management Practices on Cost and Time Overruns in Construction Projects in Nigeria. The goal of the study is to pinpoint the major project management variables that lead to overspending and delays while also offering recommendations for best practices to address these problems. A mixed-methods strategy was used, integrating qualitative case studies with quantitative data analysis. Project engineers, contractors, Architects, and Technicians were given standardized questionnaires to complete about a variety of Nigerian building projects. In-depth interviews and focus groups were also held to acquire a deeper understanding of the real-world difficulties and experiences encountered in the field. The study pinpoints several crucial project management techniques that affect time and cost

performance. The results show that Inadequate construction site management and supervision ranked 1st with an RII of 0.7877, Improper construction techniques and lack of experience of the consultant came 2nd and 3rd with RII of 0.7215 and 0.7213 respectively. Late payments during work progress and Use of improper equipment are contributors to project time overrun; while, factors affecting cost overrun are fluctuation in building material costs ranked 1st with RII of 0.7354, frequent design changes, (0.7138), omissions and errors in bills of quantities (0.6754), import of construction materials (0.6754). The report suggests enhancing project management through effective resource management techniques, ongoing training and certification programs, and implementing advanced technology to improve communication, resource management, and planning precision, contributing to sustainable growth in Nigeria's construction industry.

Karim Cheema and Mushtaq (2023) conducted a study on inadequate Risk Management's Impact on Construction Project Challenges. The purpose is to examine how poorly managing risks affects construction projects, highlighting the critical function that well-executed risk management plays in reducing project risks. A data of 150 individuals from Facebook and WhatsApp were analyzed with inferential statistics and Pearson Correlation using SPSS. Finding shows a significant positive association between these variables, highlighting the value of effective risk management. The results highlight the crucial part that efficient risk management plays in preventing and reducing issues associated with the project. To improve the results of construction projects, future plans should concentrate on a balanced risk management strategy, constant monitoring, thorough lifecycle integration, workforce development, and the integration of technology and data analytics. This study emphasizes how important effective risk management is to the successful completion of construction projects.

In a related study, Salhi and Messaoud (2023) examined the effects of delays in the Algerian construction industry in order to identify the various critical aspects of the causes for improving the economy in the construction sector. A questionnaire survey was conducted to assess the perceptions of all players in the construction industry, which led to the identification of the most significant impacts of delays. The results show that ten main effects of delays in the construction sector are at the origin of many constraints that have a negative impact on the economy of the country. Further, the factor analysis technique was performed to categorize the identified effects into main groups, and it yielded 5 groups (factors). As an important contribution, the relationship between these groups was tested using the SMART-PLS, and a structural model has been developed. Also, a comparative study with other previous works on the most critical effect of delays in construction projects has been conducted and the results show that the main effects of delays in the construction industry are at the root of many constraints in reaching and achieving the objectives.

Dixon and Armitoge (2022) addresses the issue of damaged reputation resulting from schedule overrun in Germany. According to their study, repeated delays can damage the reputation of a

company or project team. Clients may lose trust in the organization's ability to meet deadlines, potentially leading to a loss of future contracts or business.

A study by Lichtenstein and Everlart (2022) highlighted that more than 40% of project delays in the construction sector of Nepal were related to resource allocation issues. The availability and management of resources personnel, equipment or materials play a crucial role in adhering to project timelines. Resource conflicts, shortages or delays in the procurement of materials often lead to setbacks.

The research carried out by Zahran (2022) in India indicates that projects with prolonged schedule experience a 25% reduction in team morale, leading to lower output and increased likelihood of errors. The study states that extended schedules often lead to team failure, fatigue stress and burnout. As deadlines shift, team member may feel demotivated and disengaged, which can decrease productivity and create additional delays.

A research work by Garicia and Torres (2022) on effective communication and schedule overrun in construction projects in Bangladesh suggests that establishing clean communication channel and setting expectations from the start can prevent misunderstandings and minimize delays. Tools like project management software, regular status meetings, and transparent reporting keep all stakeholders aligned with project timeline.

Ahmed and Jawad (2022) carried out a study on avoiding or disregarding: Exploring the relationship between scope creep, project complexity, and the success of construction projects in Pakistan. The study aims to investigate the relationship between scope creep and the success of construction projects in the presence of project complexity. This study employed a positivism approach. Therefore, a survey method is used to collect data from 327 Pakistan's construction industry practitioners. They employed regression and PROCESS techniques were used to test research hypotheses. The findings revealed that scope creep factors (i.e. technological, organizational, and human) negatively impacts the success of construction projects, indicating that more scope creep has fewer chances of project success. Furthermore, project complexity significantly moderates the relationship between scope creep and project success, and a more complex project has fewer chances of success. The finding implies that the organizational factors have the highest influence on the success of construction projects, followed by human and technical factors of scope creep, which need to be addressed during the initiating and planning phases of the construction projects.

3.0 Methodology

This study adopted descriptive and survey research design; with applicable data collection methods and statistical analysis module to test factor relationship. However, this research is restricted to

understanding construction building projects in Rivers State. The chosen project locations include; Port Harcourt city, Oyingbo, Ikwerre and Elele Local Government Areas of Rivers State.

The population of this study comprises of selected Architects, Project Managers, Civil engineering consultants and project developers in Rivers State that has successfully completed building projects in the last ten (10) years. From the Rivers State ministry of work; the selected group for this study has a total population of 400. That is;

Architects	=	120
Project Managers	=	100
Civil engineering consultants	=	100
Project developers	=	<u>80</u>
Total	=	400

The stratified random sampling design was adopted which permits the authors to identify sub-groups within a universe population and create sample from sub-groups by randomly choosing subjects from each stratum.

Due to heterogeneity in target groups, the researchers adopted the Taro Yamane model to determine the sample size for the research.

$$n = \frac{N}{1 + N(e)^2} \quad \text{----- 3.1}$$

Where: n = sample size sought; e = level of significance (5%); N = Population size (Yamane, 1967).

$$\text{Hence, } n = \frac{400}{1 + 400(0.05)^2} = 200$$

Therefore, the study sampled 200 respondents based on the sample formula used.

3.1 Method of Data Collection

Data for this study were collected from two sources: primary and secondary sources.

Primary Data: This method of data collection was the original data assembled specifically for the problem under consideration. The survey used questionnaire to collect first hand data.

The survey was created to gather opinion from experienced project team who has worked or are still working on construction of houses or buildings projects in Rivers State; for at least the past ten (10) years. A total of two hundred (200) questionnaires were distributed on face-to-face delivery and emails. The questions were calibrated in Likert's five (5) point scale and the numerical values assigned to frequency of occurrence and impact are: Strongly Agreed (SA) = 5 points; Agreed (A) = 4 points; Neutral (N) = 3 points; Disagree (D) = 2 points; Strongly disagree (SD) = 1 point.

The Likert scale examines the individual effect of factors under consideration that are responsible for schedule overrun in project implementation.

The stratified sampling method was used to determine the number and distribution of the questionnaire to the selected groups as indicated below; Architects = 50; Civil engineering consultant = 50; Project managers = 50; Project developer/owners = 50

Based on individual respondent ranking, the data were processed within Crombach's alpha coefficient of internal consistency/reliability tests for level of frequency and degree of impact.

Secondary Data: The secondary sources of information which provide the theoretical background was obtained from research related journal, textbook, newspapers, magazines, as well as the internet. The research also reviewed some relevant official project documents to get information on the effect of the selected factors on schedule overruns during construction phase.

Reliability is the degree of consistency between multiple measurements of a variable. It is the extent to which the measurement is random error-free and produces the same results on repeated trials. Hence, the test-retest method of reliability was adopted to ensure that all constructs in this study falls within acceptable range and as such would all be accepted for further analysis. An initial pilot survey was conducted and 20 copies of the questionnaire were distributed to targeted respondents, the researcher waited for two weeks and re-administered the same questionnaires and the first and the second scores were recorded using excel package.

Using the Pearson correlation model as given below:

$$r = \frac{n \sum xy (\sum x) (\sum y)}{\sqrt{(n \sum x^2 - (\sum x)^2) (n \sum y^2 - (\sum y)^2)}}$$

Pearson's correlation (r) = 0.99187 $\cong$ 0.99 was obtained indicating that the instrument used is reliable. Implication of the correlation of $r = 1$, shows that there is a perfect positive relationship

between the scores on the test variables and the scores on the re-test variables. Thus, a correlation of 1 means that the instrument used to carry out the research work was reliable (Eisinga et al, 2013).

3.2 Method of Data Analysis

Analysis of the data collected for the study began with ordering of responses into meaningful categories by editing, coding and tabulating the replies to both the oral interviewed and questionnaire. The alternative view of project scheduling puts greater emphasis on practical factors rather than on inherent factors limiting schedule in project delivery.

The data techniques used to test the hypotheses proffered in chapter one is the sample t test. The One Sample t-test determines whether the sample mean is statistically different from a known or hypothesized population mean. The One Sample t-test is a parametric test. This test is also known as Single Sample t-test. The variable used in this test is known as Test variable. In a One Sample t-test, the test variable is compared against a "test value", which is a known or hypothesized value of the mean in the population. (Minitab, 2016).

Decision Rule: Accept H_0 if $\alpha > t_{cal}$. Otherwise Reject H_0 if $\alpha < t_{cal}$. The test was done at S 95% confidence interval and 5% level of significance (at $\alpha = 0.05$)

4.0 Results and Discussions

A total of 200 copies of questionnaire were shared to respondent groups across selected localities in Rivers State out of which 127 copies were properly completed and returned. It has a return rate of 63.5%. The total number of copies of questionnaire distributed and received were shown in Table 1.

Table 1 Questionnaire Return Rate

Options	No. Distributed	No. Returned	No. Not Returned	% Returned
Architects	50	27	23	21.26
Civil Engineering Consultants	50	33	17	26
Project Managers.	50	47	3	37
Project developer/owners	50	20	30	15.74
Total	200	127	73	100

Source; Field survey, 2026

4.2. Testing of Hypotheses

The formulated hypotheses were tested using the one sample t-test at 5% level of significance.

Testing of Hypothesis I

H₀₁: There is no significant relationship between poor planning and estimation and building project schedule overrun in Rivers State.

To test for this hypothesis, the analysis on table 2 was used to determine whether or otherwise of the hypothesis.

Table 2 One-Sample Test

	Test Value = 2.5					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
There is no significant relationship between poor planning and estimation and building project schedule overrun in River State.	7.104	126	.000	.52362	.3778	.6695

From Table 2, the t-value of 7.104 is significance at 0.000 level of significance. The implication is that at 0.05 level of significance, the null hypothesis is rejected. Hence, the study accept the alternative and conclude that there is significant relationship between poor planning and estimation and building project schedule overrun in Rivers State.

Testing of Hypothesis 2

H₀₂: There is no significant relationship between scope creep and building project schedule overrun in Rivers State.

To test this hypothesis, the analysis on table 3 was used.

Table 3 **One-Sample Test**

	Test Value = 2.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
There is no significant relationship between scope creep and building project schedule overrun in Rivers State	8.924	126	.000	.63386	.4933	.7744

Since t-value is 8.924, we reject the null hypothesis that the sample mean is equal to the hypothesized population mean and conclude that there is significant relationship between scope creep and building project schedule overrun in Rivers State

Testing of Hypothesis 3

H₀₃: There is no significant relationship between inadequate risk management and building project schedule overruns in Rivers State

Table 4 **One-Sample Test**

	Test Value = 2.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
There is no significant relationship between inadequate risk management & building project schedule overruns in River State	8.937	126	.000	.56299	.4383	.6877

Since t-value is 8.937, we reject the null hypothesis that the sample mean is equal to the hypothesized population mean and conclude that there is significant relationship between inadequate risk management and building project schedule overruns in River State.

Testing of Hypothesis 4

H₀₄: There is no significant relationship between resource efficiency and building project schedule overruns in Rivers State.

Table 5

One-Sample Test

	Test Value = 2.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
There is no significant relationship between resource efficiency and building project schedule overruns in River State	14.379	126	.000	.81496	.7028	.9271

From Table 5, the t-value of 14.379 is significance at 0.000 level of significance. The implication is that at 0.05 level of significance, the null hypothesis is rejected. Hence, the study accepts the alternative and conclude that there is significant relationship between resource efficiency and building project schedule overruns in Rivers State.

4.1 Discussion of Findings

Based on the findings made, the following can be deduced:

i.) According to the analysis conducted imply that there is significant relationship between poor planning and estimation and building project schedule overrun in Rivers State (see Table 2). Also, this was in conformity with construction sector in Nigeria as highlighted by (Elinwa & Joshua, 2013) that effective planning and estimation reduces building project schedule overrun. Also, in the Caribbean and Pacific Islands, building construction projects face persistent challenges related to performance, including delays, cost overruns, time overruns and quality issues; were mitigated with planning and estimation (Callistus, Felix, Ernest, Stephen & Andrew, 2014).

ii.) Also, there is significant relationship between scope creep and building project schedule overrun in, Rivers State (see Table 3). This was in conformity with Clamp, Cox and Lupton (2017), that scope creep, or "requirement creep," happens when a project's requirements increase during its lifecycle—turning a single deliverable into several deliverables or a product with a few features into multiple features and specifications. This can occur because stakeholders change their minds or due to miscommunication during the initiation and definition of the project scope. While scope creep can cause delays, roadblocks, or budget overruns, it is not always negative. Changes often occur because customer needs evolve, and meeting those needs may mean adjusting the scope. Good project team anticipates and plan for scope creep to deliver projects that fully meet customer demands. Similarly, according to PMI (2019) lack of scope creep management was the main reason for project failure. The reports, affirmed that more than 50% of building projects have experienced scope creep and has led to serious cost overruns. According to Amoatey and Anson (2017) scope creep can cost up to four times as much as initial development cost.

iii.) There is significant relationship between inadequate risk management and building project schedule overruns in, Rivers State (see Table 4). However, this was in conformity with Agyekum-Mensah and Knight, (2017) that ensuring a project's completion, risk management process should boost the achievement of the project's goals and objectives. They stressed that Project Risk Management should evolve into Project Uncertainty Management. Effective risk management involves more than just following a set of procedures; it involves an extensive range of processes (Albtoush & Doh, 2019). Allocating risks, or deciding who will be responsible for what, is a crucial element of any project management process. It is crucial to determine the project manager's attitude towards risk before making any judgments on risk allocation. Prior to assigning risks, a project manager should have a clear understanding of their risk management approach and their ability to handle and reduce risks. There is a need for a more holistic view in addition to the traditional project risk management method, which entails detecting, categorizing, and planning to minimize risks associated to the project (Gupta & Kumar, 2020). However, Nnadi, Obiechefu and Egwuagu (2024), posits that effective risk management begins with recognizing and mitigating risks associating resource management and allocation. According to Nnadi and Obasi (2018) problems with resources are the main reason behind building project overruns. Overruns in Expense and Duration in Nigerian Construction Projects involve the frequency of time and expense overruns in Nigerian building projects as has been shown by numerous studies

iv.) Again, there is significant relationship between resource constraint and building project schedule overruns in, Rivers State. This assertion conforms to Shalk (2016) that successful implementation of a building construction project not only depends on the quality & quantity of work, but also largely depends on availability of resources. All activities involved in the project require allocation of certain amount of specific resources and which must be completed within the time limit, otherwise it may adversely affect the overall duration of the project (Njau & Ogolla, 2017). Similarly, Pinha and Ahluwalia (2019), stated that flexible resource management affect project duration and cost, and that poor resource management is often the leading cause of cost overruns and schedule slippage.

5.0 Conclusion

This study has shown that there is significant relationship between poor planning and estimation; scope creep; inadequate risk management and resource efficiency as factors that strongly cause schedule overruns in the delivery of building project in Rivers State. The study found that these factors affect the process of constructing a building structure; across its stages and requires the involvement of building experts in order to moderate their negative impact.

Additionally, the study concludes that Architects; Civil engineering consultant; Project managers and Project developers/owners consent to the opinion that proper coordination and good

communication among various parties working on the project is very important for enhancing management effectiveness, control problems and in reducing any avoidable delay. The study also concludes that proper resources planning; duration estimation and schedule development and control are very important for ensuring efficient time management in building project delivery in Rivers State.

However, the following recommendations were made;

- 1.) Architect should ensure adherence to work plan and adequate supervision to in order to correct early errors.
- 2.) Civil Engineering Consultants and Project Managers should become more alive to their responsibilities as cost experts ensuring that they make use of correct estimation methods. There should be thorough crosschecking of estimates based on updated price information in order to avoid any wrong estimation.
- 3.) Project developer/owners should ensure appropriate scope definition of the project to avoid additional work which may increase the cost of the project.
- 4.) Clear requirements definition, stakeholder engagement, robust change control processes, realistic planning, and leveraging technology are very crucial in addressing the challenge of scope creep and ensuring successful project completion on time and within budget.

Contribution to Knowledge

Theoretically, this study has contributed to extant literature on effect of specific causative factors of schedule overrun on building projects in Rivers State which hitherto are rarely available. The findings presented by this study enable us to gain a deeper understanding of how poor planning and estimation; scope creep; inadequate risk management and resource inefficiency affect the disposition of Architects; Civil Engineering Consultants; Project Managers and Project developer/owners in managing schedule overrun in particularly building projects.

Empirically, the contribution hinged on the specific values $p > 0.05$ across included variables in the formulated hypothesis which before now were rarely available in extant empirical studies. This outcome has implication for the degree of project learning capacity that the respondents perceived within their designations; which encompass for example the degree that the commitment to new project sustainable ideas, information sharing or involvement in decisions at different stages or phases of the building project. Furthermore, the analysis is cross-sectional and therefore provides only a snapshot of causative factor of building project schedule overrun in the local government areas of Rivers State studied.

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