INTEGRATED SOLUTIONS

Problems Facing Consultant Engineers and Integrated Solutions for Improved Project Performance in the Nigerian Construction Industry: A Survey of Professionals in Ibadan

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Abstract

Consultant engineers are central to the delivery of construction projects, yet project failures in Nigeria are frequently linked to deficiencies in design, supervision and professional conduct. Existing studies have largely examined these deficiencies in isolation. This study assessed fifteen consultant-related problems in terms of frequency and severity, examined their perceived effect on project cost, time, quality and safety, and evaluated fifteen technological, managerial and regulatory solutions among professionals who work with consultant engineers in Ibadan, Nigeria. A descriptive cross-sectional survey was conducted using a structured questionnaire (Cronbach's alpha = 0.86 in the pilot study) administered to 60 professionals with at least five years of field experience, comprising consultant engineers (n = 22), contractor site engineers (n = 17), client project managers (n = 17) and other professionals (n = 4). Data were analysed using descriptive statistics, the Relative Importance Index (RII), a one-sample t-test and Friedman tests. Respondents rated the problems as low in frequency (overall mean = 2.22 out of 5) but high in severity (overall mean = 4.08). Inadequate geotechnical investigation was the most frequently reported problem (mean = 2.42), whereas lack of specialised building services expertise was the most severe (mean = 4.23). Respondents agreed strongly that these problems affect project performance (mean agreement = 4.27), and all fifteen solutions were strongly endorsed; however, the ranking items did not produce a valid priority order, and no significant differences were found within solution groups (Friedman test, $p > 0.05$). The findings indicate that consultant-related problems, although perceived as infrequent, carry serious consequences for project performance, and that technological, managerial and regulatory measures are supported as complementary remedies. The conclusions are limited by a small purposive sample drawn from one city and by the reliance on perception-based data.

Keywords: Consultant engineers; Construction project performance; Geotechnical investigation; Integrated solutions; Nigeria; Relative Importance Index

1 Introduction

The construction sector provides the physical basis for economic growth, urbanisation and social welfare. In developing countries such as Nigeria, demand for roads, commercial buildings and industrial facilities continues to rise, particularly in fast-growing cities such as Ibadan. The consultant engineer is central to delivering these assets, translating the client's requirements into designs that are structurally sound, economically reasonable and safe, and supervising their execution through the pre-design, design and post-contract phases (Project Management Institute [PMI], 2021). The competence and managerial rigour of the consultant therefore influence whether a project achieves its

cost, time and quality targets. For example, Jega et al. (2025) found that consultants' lack of experience is a major source of contract variations, which in turn cause time overruns and end-user dissatisfaction.

Despite this mandate, the Nigerian construction industry continues to experience abandoned projects, cost overruns, protracted time extensions and, in the worst cases, structural collapse. Adegbenro (2025) attributed the poor state of Nigeria's roads to professional negligence, weak supervision and compromised standards among engineers rather than to inadequate funding. Regulators have also begun to respond: the Council for the Regulation of Engineering in Nigeria (COREN) has entered into a partnership with the Independent Corrupt Practices and Other Related Offences Commission (ICPC) to enforce compliance and sanction erring practitioners (ICPC, 2025).

Empirical studies have documented several consultant-related problems. These include limited use of information and communication technology (ICT) (Ikediashi & Ogwueleka, 2016), poor design and late instructions that lead to disputes with contractors (Ejohwomu et al., 2016), unethical practices (Adeyemo & Amade, 2016; Aluko et al., 2021), inadequate consultant involvement in the early stages of projects (Tanko et al., 2017), rework arising from poor design and weak supervision (Eze & Idiake, 2018), omission of comprehensive soil investigations (Odeyemi et al., 2019), client dissatisfaction with service quality (Dosumu & Aigbavboa, 2019) and a shortage of specialised building services expertise (Oyeyipo et al., 2025). A parallel body of work has proposed remedies, including technology adoption (Oke et al., 2021; Fagbenro et al., 2022; Aliu et al., 2025), training and institutional support (Unegbu et al., 2025), structured project management practice (Unegbu et al., 2022), integrated project delivery (Ebekozien et al., 2023) and the empowerment of project managers (Iroha et al., 2024).

Two theoretical perspectives help to explain why such problems arise and how they spread. Principal–Agent Theory (Jensen & Meckling, 1976; Eisenhardt, 1989) describes the client as a principal who delegates technical work to a consultant who holds superior information; this information asymmetry creates the risks of adverse selection before appointment and moral hazard afterwards. The Project Management Iron Triangle, in turn, holds that time, cost and quality are interdependent, so that a deficiency introduced by the consultant in one dimension is transmitted to the others (PMI, 2021).

However, existing studies have largely examined these problems and their remedies in isolation, with some emphasising technology and others ethics, supervision, training or regulation. Many also generalise across clients, contractors and engineers, which can obscure the specific difficulties of consultant engineers, and few distinguish how often a problem occurs from how serious its consequences are. As a result, the proposed interventions remain partial and fragmented.

This study therefore focused exclusively on consultant engineers in the Nigerian construction industry, using Ibadan as the study area. Its objectives were to (i) identify the key problems facing consultant engineers and rate them by frequency and severity; (ii) assess the perceived impact of these problems on project cost, time, quality and safety; and (iii) evaluate technological, managerial and regulatory solutions that can be combined to address them. The study provides locally grounded evidence on a topic that has mostly been examined through general studies of construction delay.

2 Materials and methods

2.1 Research design and study area

A descriptive, cross-sectional survey design was adopted to describe the prevailing conditions, practices and consequences associated with consultant performance at a single point in time (Creswell & Creswell, 2018; Saunders et al., 2019). The study was conducted in Ibadan, the capital of Oyo State, Nigeria, which was selected because it is one of the largest and fastest-growing urban centres in the country, with continuing road expansion and residential, institutional and commercial development. The target population comprised active professionals who interact directly with consultant engineers during project delivery, namely registered civil and structural engineering consultants, senior site engineers working for contractors, and client project managers.

2.2 Sampling and respondents

Respondents were selected by purposive sampling, which involves the deliberate selection of participants who possess characteristics relevant to the research objectives (Etikan et al., 2016). The inclusion criterion was at least five years of active field experience in the Nigerian construction industry, so that respondents had sufficient exposure to consultant-related issues to judge their effects. Sixty questionnaires were distributed across registered engineering firms and active project sites in the Ibadan metropolis, roughly evenly among the three professional categories, and 60 completed questionnaires were analysed.

2.3 Research instrument

Data were collected using a structured, self-administered questionnaire developed from the problems and solutions identified in the literature. The questionnaire comprised four sections. Section A captured demographic information, including professional category, years of experience, educational qualification, professional registration and the types of projects most frequently handled. Section B asked respondents to rate fifteen consultant-related problems on two dimensions, namely how frequently each occurs and how severely it affects projects. Section C presented fifteen statements linking consultant deficiencies to cost, time, quality and safety outcomes and to the two theoretical propositions of the study. Section D asked respondents to rank five technological, five managerial and five regulatory solutions from 1 (most effective) to 5 (least effective). Responses in Sections B and C were recorded on a five-point scale (frequency and severity: 1 = very low to 5 = very high; agreement: 1 = strongly disagree to 5 = strongly agree). A five-point scale provides sufficient granularity to distinguish degrees of opinion without overburdening respondents and is widely used in construction management research (Aluko et al., 2021; Oyeyipo et al., 2025).

2.4 Validity and reliability

Face and content validity were established through expert review. The draft questionnaire was reviewed by two senior academics in the Department of Civil Engineering, University of Ibadan, who specialise in construction management and structural engineering, and by two practising structural consultants with more than 15 years of experience. The reviewers assessed whether each item was clear, comprehensive and suitable for the target population; on the basis of their comments, some items were reworded or rearranged and a few additional items were included. The instrument was then pilot-tested with 15 engineers from another location in Ibadan to check clarity, completion time (approximately 20–25 minutes) and administration logistics. Internal consistency, which describes

how well the items of a scale measure the same construct (Field, 2018), was assessed on the pilot data using Cronbach's alpha, which was 0.86. This value indicates good internal consistency (George & Mallery, 2019).

2.5 Data analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 28. Frequencies and percentages were used to describe the respondents, and means and standard deviations were used to summarise the five-point ratings. The Relative Importance Index (RII) was calculated as the sum of the ratings divided by the product of the highest possible rating (5) and the number of respondents, and was used with the mean score to rank problems and statements. Mean scores were interpreted using the following bands: 1.00–1.80 (very low), 1.81–2.60 (low), 2.61–3.40 (moderate), 3.41–4.20 (high) and 4.21–5.00 (very high); the equivalent bands for agreement ranged from strongly disagree to strongly agree. A one-sample t-test against the scale midpoint (3.00) was used to test the overall frequency rating, and Friedman tests were used to compare mean ranks within each group of solutions. Differences between professional categories were described but not tested. The level of significance was set at 0.05.

2.6 Ethical considerations

Informed consent was obtained from all respondents. Each questionnaire carried a cover letter explaining the purpose of the study, the voluntary nature of participation, the right to withdraw at any time without penalty, and the assurance that responses would be used solely for academic research. Respondents' anonymity and the confidentiality of the data were maintained, and no sensitive personal or commercial information was solicited.

3 Results and discussion

3.1 Respondent profile

Table 1 summarises the demographic characteristics of the 60 respondents. Consultant engineers formed the largest group (36.7%), followed by contractor site engineers and client project managers (28.3% each) and other professionals (6.7%). All respondents satisfied the minimum five-year experience criterion; more than half (53.3%) had between 5 and 10 years of field experience, and 21.7% had more than 15 years. Most respondents held a first degree (43.3%) or a master's degree (41.7%), and 10.0% held a doctorate. Just over half (53.3%) were registered with COREN, alone or together with the Nigerian Society of Engineers (NSE). The 21.7% who reported other professional certifications under registration were mainly client project managers (7 of 13). Respondents were most frequently involved in residential buildings (63.3%), whereas only 16.7% reported involvement in road and highway infrastructure; the findings therefore reflect experience in building projects more than in highway works.

Table 1. Demographic characteristics of respondents (N = 60).

Characteristic	Frequency	Percentage (%)
Professional category		
Civil/structural engineers (consultants)	22	36.7

Characteristic	Frequency	Percentage (%)
Senior site engineers (contractors)	17	28.3
Client project managers	17	28.3
Other (quantity surveyor, estate surveyor/valuer, mechanical engineer, technical director)	4	6.7
Years of active field experience		
5–10 years	32	53.3
11–15 years	15	25.0
16–20 years	4	6.7
Above 20 years	9	15.0
Highest educational qualification		
B.Sc/B.Eng	26	43.3
M.Sc/M.Eng	25	41.7
PhD	6	10.0
Other professional certifications	3	5.0
Professional registration		
COREN and NSE (both)	18	30.0
NSE member only	15	25.0
COREN registered only	14	23.3
Other professional certifications	13	21.7
Project type (multiple responses)		
Residential buildings	38	63.3
Commercial buildings	24	40.0
Public/institutional buildings	10	16.7
Road/highway infrastructure	10	16.7

Source: Field survey (2026).

3.2 Frequency of consultant-related problems

Respondents rated the fifteen consultant-related problems as occurring at a low frequency (Table 2). Item means ranged from 2.02 to 2.42, all within the low band, and the overall mean frequency of 2.22 (SD of respondent means = 0.89) was significantly below the scale midpoint of 3.00, $t(59) = -6.75$, $p < 0.001$. Across all frequency ratings, 61.7% were “infrequent” or “very infrequent” and only 14.6% were “frequent” or “very frequent”; for no single problem did more than 20.0% of respondents select the latter two options. Inadequate geotechnical investigation before design (M = 2.42), delayed approval of material samples and submissions (M = 2.40), poor or infrequent site supervision (M = 2.37), low adoption of ICT tools (M = 2.33) and delayed responses to requests for information (RFIs) (M = 2.32) were the most frequently reported problems, whereas inadequate project management and coordination (M = 2.02) was the least frequent.

Table 2. Frequency and severity of consultant-related problems (N = 60).

Problem	Freq. mean	Freq. SD	Freq. RII	Freq. rank	Sev. mean	Sev. SD	Sev. RII	Sev. rank
Incomplete or uncoordinated design documents	2.17	0.99	0.433	10	4.15	0.94	0.830	4
Delayed responses to site queries and RFIs	2.32	1.16	0.463	5	4.10	0.82	0.820	7
Inadequate geotechnical investigation before design	2.42	1.18	0.483	1	4.20	0.92	0.840	2
Poor or infrequent site supervision	2.37	1.04	0.473	3	4.05	0.87	0.810	9
Delayed approval of material samples and submissions	2.40	1.20	0.480	2	4.02	0.87	0.803	10
Errors in structural calculations and load analysis	2.08	1.01	0.417	13	4.15	0.80	0.830	4
Low adoption of modern ICT tools (BIM, PM software)	2.33	1.22	0.467	4	3.83	0.98	0.767	15
Inexperienced junior staff on critical supervision	2.20	1.10	0.440	8	4.08	0.93	0.817	8
Unethical practices	2.08	1.06	0.417	13	4.20	0.82	0.840	2
Inadequate project management and coordination	2.02	1.02	0.403	15	4.00	0.84	0.800	13
Lack of specialised building services (MEP) expertise	2.10	1.22	0.420	12	4.23	0.77	0.847	1
Ambiguous or conflicting design details	2.20	1.07	0.440	8	4.02	0.85	0.803	10
Slow certification of interim payment certificates	2.27	1.06	0.453	6	4.02	0.91	0.803	10
No internal peer review of design documents	2.22	1.12	0.443	7	3.98	0.89	0.797	14
Inconsistent or unclear site instructions	2.15	1.02	0.430	11	4.13	0.85	0.827	6
Overall (SD of respondent means)	2.22	0.89	–	–	4.08	0.70	–	–

Source: Field survey (2026). RII = Relative Importance Index; RFIs = requests for information; tied items share a rank.

The prominence of geotechnical shortcomings agrees with Odeyemi et al. (2019), who documented that some consultants omit comprehensive soil testing to reduce pre-contract costs. Likewise, the relatively high position of delayed approvals, delayed responses and weak supervision is consistent with earlier reports that consultant responsiveness and site presence are sources of delay and conflict (Ejohwomu et al., 2016; Tanko et al., 2017; Dosumu & Aigbavboa, 2019). However, the overall low frequency contrasts with the widespread dissatisfaction described by Dosumu and Aigbavboa (2019) and Oyeyipo et al. (2025). This difference may reflect the separate measurement of frequency and severity in the present study, the composition of the respondent groups, which included consultants rating their own profession, the sensitivity of some items, or the local context; the present data cannot discriminate between these explanations. In addition, the item means differed

little (a range of 0.40 points), so the ordering should be read as a tendency and not as a sharp distinction.

3.3 Severity of consultant-related problems

In contrast to frequency, respondents rated every problem as having a high or very high impact on project delivery (Table 2). Item means ranged from 3.83 to 4.23, the overall mean severity was 4.08 (SD of respondent means = 0.70), and 76.6% of all severity ratings were "high impact" or "very high impact". Lack of specialised building services (MEP) expertise ranked first (M = 4.23, RII = 0.847), followed by inadequate geotechnical investigation and unethical practices (both M = 4.20, RII = 0.840) and by incomplete or uncoordinated design documents and errors in structural calculations (both M = 4.15, RII = 0.830). Low ICT adoption (M = 3.83) and the absence of internal peer review (M = 3.98) ranked lowest, although both remained in the high band (Figure 1). The spread between the highest and lowest items was only 0.40 points.

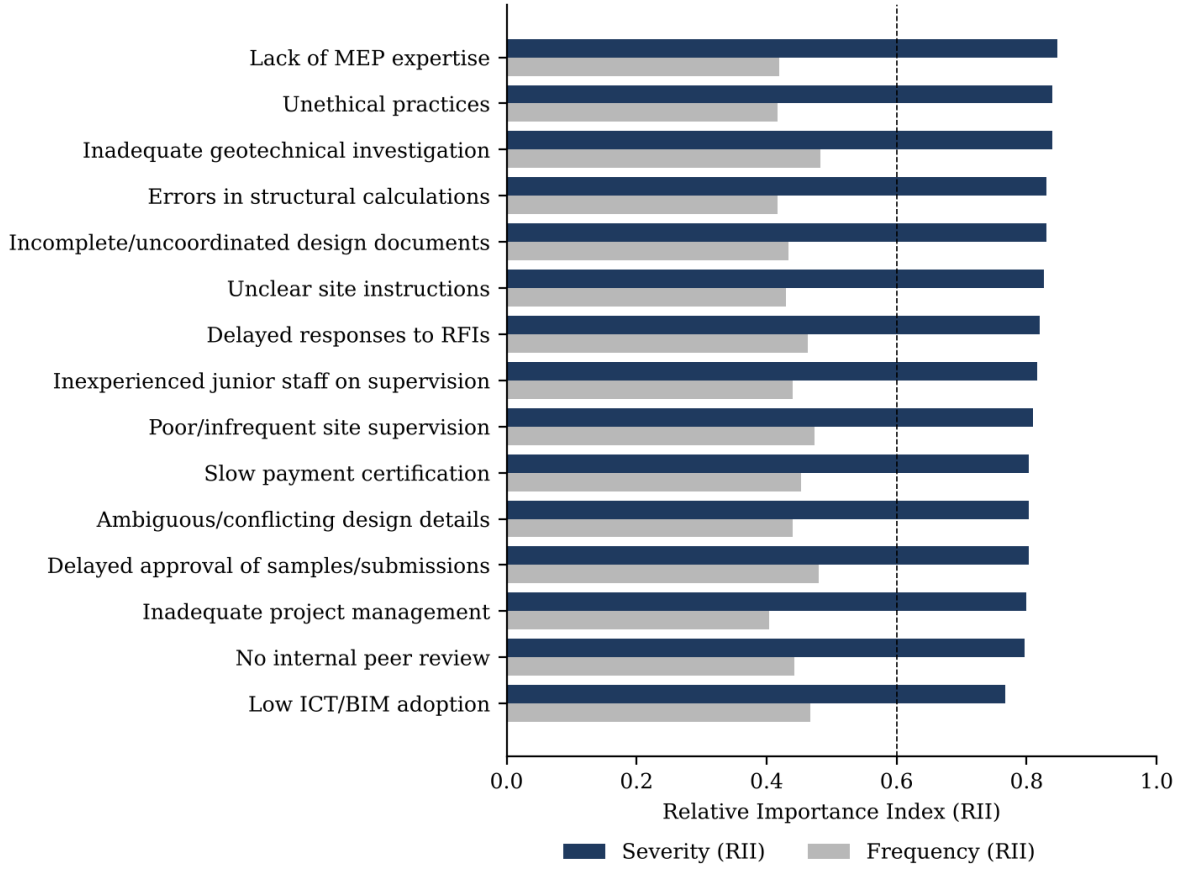


Figure 1. Relative Importance Index of frequency and severity of consultant-related problems.

The contrast between frequency and severity is the central pattern in the data: problems that respondents considered uncommon were nevertheless considered costly when they occur. Lack of specialised building services expertise, for example, was the most severe problem but ranked only twelfth in frequency, which suggests a gap that is damaging where it exists rather than universal, and which qualifies the pervasive shortage reported by Oyeyipo et al. (2025). Similarly, unethical practice was rated high in severity but low in frequency, in contrast to the serious and persistent problem described in the corruption literature (Adeyemo & Amade, 2016), although its severity is consistent

with the erosion of client trust reported by Aluko et al. (2021). Low ICT adoption, which Ikediashi and Ogwueleka (2016) treat as an important determinant of project performance, was the least severe problem here, even though respondents still agreed that it slows communication and decisions (Table 3).

3.4 Perceived impact on project performance

Respondents agreed strongly that consultant-related problems damage project performance (Table 3). The overall mean agreement was 4.27 (SD of respondent means = 0.57), and between 73.3% and 93.3% of respondents agreed or strongly agreed with each statement. Agreement was highest for the statement that design errors and omissions significantly increase project costs (M = 4.50; 93.3% agreement), followed by the statements that unethical practice erodes client trust (M = 4.40), that coordination failures between design disciplines cause clashes and rework (M = 4.33) and that information asymmetry leads to suboptimal outcomes (M = 4.33). The four performance dimensions received similar levels of agreement: cost (4.35), safety (4.32), time (4.25) and quality (4.25). The lowest agreement, although still in the "agree" band, was for the statement that addressing consultant problems alone would substantially improve overall project performance (M = 3.87; 73.3% agreement; 7 of 60 respondents disagreed or strongly disagreed).

Table 3. Respondents' agreement with the impact statements (N = 60).

Statement	Mean	SD	RII	% agree	Rank
C1. Design errors/omissions increase project costs	4.50	0.75	0.900	93.3	1
C2. Delayed responses to queries cause time overruns	4.25	0.75	0.850	88.3	9
C3. Inadequate supervision compromises quality	4.25	0.86	0.850	83.3	9
C4. Poor geotechnical investigation causes foundation failure and safety risk	4.32	0.89	0.863	88.3	5
C5. Consultant-induced variations cause budget overruns	4.20	0.94	0.840	83.3	14
C6. Unethical practice erodes client trust	4.40	0.74	0.880	88.3	2
C7. Low ICT adoption slows communication and decisions	4.25	0.82	0.850	86.7	9
C8. Inexperienced staff harm all performance dimensions	4.28	0.85	0.857	85.0	7
C9. Coordination failures cause clashes and rework	4.33	0.66	0.867	93.3	3
C10. Delayed payment certification creates cash-flow problems	4.27	0.63	0.853	90.0	8
C11. Iron Triangle explains propagation of inefficiency	4.23	0.83	0.847	85.0	12
C12. Information asymmetry leads to suboptimal outcomes	4.33	0.68	0.867	88.3	3
C13. Consultant problems outweigh contractor problems	4.22	0.85	0.843	85.0	13
C14. Weak enforcement lets incompetent consultants practise	4.30	0.87	0.860	90.0	6
C15. Addressing consultant problems alone would substantially improve performance	3.87	1.13	0.773	73.3	15
Overall mean agreement (SD of respondent means)	4.27	0.57	–	–	–

Source: Field survey (2026). % agree = respondents selecting "agree" or "strongly agree". Cost = mean of C1 and C5; time = C2; quality = C3; safety = C4.

These results are consistent with studies linking consultants' inexperience, poor design and weak supervision to variations, delays and rework (Eze & Idiake, 2018; Jega et al., 2025). The strong agreement that the Iron Triangle explains the propagation of inefficiency (M = 4.23) and that information asymmetry (M = 4.33) and weak enforcement (M = 4.30) sustain poor outcomes is consistent with the theoretical perspectives adopted, although a survey of perceptions cannot test these mechanisms directly. Notably, respondents agreed that consultant problems outweigh contractor problems (M = 4.22) yet gave the lowest agreement to the view that correcting consultant problems alone would suffice, indicating that consultants were regarded as an important but not the only source of poor project performance.

3.5 Evaluation of integrated solutions

Respondents were asked to rank five technological, five managerial and five regulatory solutions from 1 (most effective) to 5 (least effective). The responses show, however, that the ranking instruction was not applied as a forced ranking. Across the three groups, no respondent produced a valid ranking in which each of the numbers 1 to 5 was used once, and 22 respondents (technological), 24 (managerial) and 23 (regulatory) gave a rank of 1 to all five items in the group. The data therefore reflect how strongly respondents endorsed each solution, not a priority ordering between solutions (Table 4). Mean ranks lay between 1.51 and 1.70 for all fifteen solutions, 81.7% to 89.8% of respondents placed each solution in their top two, and 51.7% to 68.3% gave each a rank of 1. The highest shares of first-rank selections went to minimum geotechnical investigation standards (68.3%), stricter COREN enforcement and sanctions (66.1%) and mandatory internal peer review of design documents (66.1%). Friedman tests found no significant differences in mean rank within the technological, managerial or regulatory groups (p = 0.266, 0.473 and 0.105, respectively); the order within each group in Table 4 is therefore listed by mean rank for completeness and should not be taken as evidence that one solution is superior to another.

Table 4. Evaluation of the proposed integrated solutions.

Solution	Mean rank	SD	Ranked 1 (%)	Top two (%)
Technological solutions				
Modern structural analysis/design software	1.54	0.84	61.0	89.8
Cloud-based PM/document platforms	1.58	0.75	55.9	88.1
Building Information Modelling (BIM)	1.58	0.96	63.3	86.7
Blockchain/DLT document authentication	1.63	0.84	54.4	87.7
Digital quality testing/reporting tools	1.69	0.91	54.2	83.1
Managerial and organisational solutions				
Mandatory internal peer review	1.51	0.88	66.1	89.8
Structured mentoring programmes	1.63	0.92	58.3	86.7
Dedicated, empowered project managers	1.64	1.01	59.3	88.1
Formal service level agreements (SLAs)	1.65	0.92	55.0	88.3
Formal PM methodologies	1.65	0.88	56.7	83.3
Regulatory and institutional solutions				
Stricter COREN enforcement and sanctions	1.51	0.88	66.1	89.8

Solution	Mean rank	SD	Ranked 1 (%)	Top two (%)
Minimum geotechnical investigation standards	1.53	0.95	68.3	86.7
Milestone-based fee structures	1.57	0.87	61.7	88.3
CPD mandates	1.67	1.00	61.7	81.7
ICPC collaboration with professional bodies	1.70	0.91	51.7	85.0

Source: Field survey (2026). Lower mean rank indicates higher perceived effectiveness. Valid n = 57–60 per item. Within-group differences are not statistically significant (Friedman test, $p > 0.05$).

Broad endorsement of all three groups of solutions is consistent with studies supporting technology adoption (Oke et al., 2021; Fagbenro et al., 2022; Aliu et al., 2025), structured project management practice (Unegbu et al., 2022) and empowered project managers (Iroha et al., 2024), and the support for minimum geotechnical standards echoes the recommendation of Odeyemi et al. (2019). The results support treating the technological, managerial and regulatory measures as complementary, but the study could not establish which should be introduced first.

3.6 Differences by professional category

Table 5 and Figure 2 compare the respondent groups. Contractor site engineers reported the lowest frequency of problems (M = 1.67) but the highest severity (M = 4.38) and impact agreement (M = 4.59), whereas client project managers reported the highest frequency (M = 2.77) but the lowest severity (M = 3.78) and impact agreement (M = 3.99). Consultant engineers lay between the two (M = 2.25, 4.15 and 4.31, respectively). Because these differences were not tested for statistical significance and the groups were small, they are described as patterns in the sample and not as established differences between groups. Twenty-two respondents (36.7%) were consultants rating their own profession, which may have influenced their ratings.

Table 5. Mean scores by professional category (respondent-level means).

Category	n	Freq. M	Freq. SD	Sev. M	Sev. SD	Impact M	Impact SD
Consultant engineers	22	2.25	0.94	4.15	0.77	4.31	0.61
Contractor site engineers	17	1.67	0.54	4.38	0.33	4.59	0.38
Client project managers	17	2.77	0.87	3.78	0.77	3.99	0.49
Other professionals	4	2.07	0.67	3.65	0.68	3.83	0.72
All respondents	60	2.22	0.89	4.08	0.70	4.27	0.57

Source: Field survey (2026). Freq. = frequency; Sev. = severity; Impact = agreement with the impact statements.

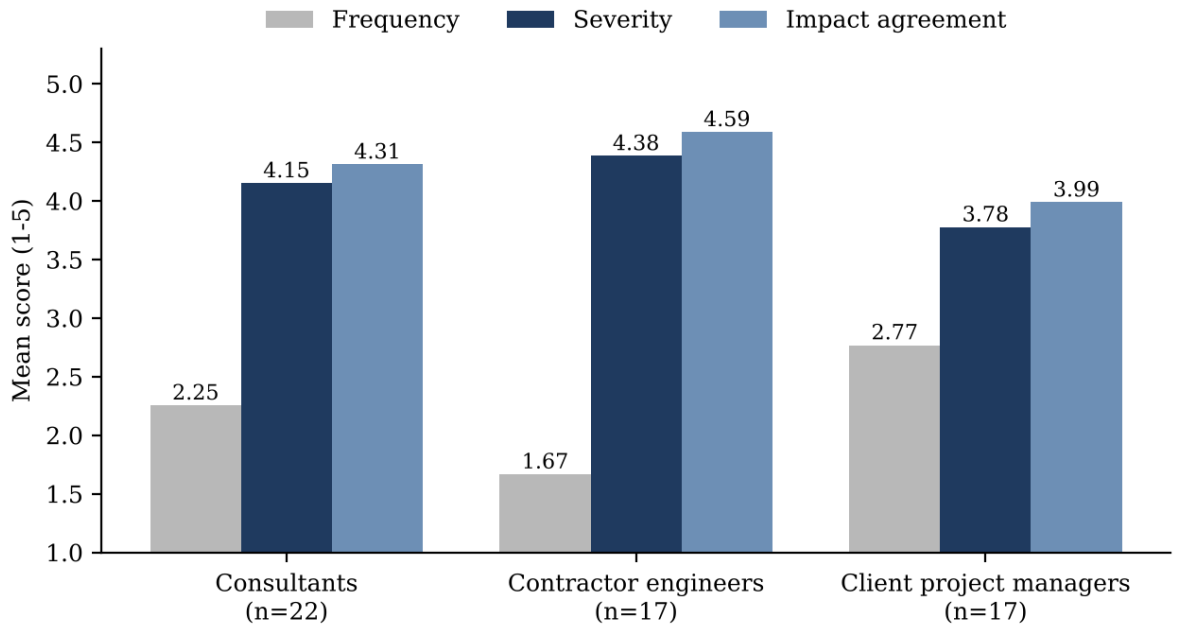


Figure 2. Mean frequency, severity and impact scores by professional category.

3.7 Comparison with previous studies

The findings of the present study are compared with earlier Nigerian studies in Table 6. The strongest agreement with earlier work concerns the content and consequences of the problems, whereas the main differences relate to how often the problems occur and to the relative weight attached to ICT and to specialised expertise. Most of the earlier studies reviewed examined either the causes of a problem or the level of client satisfaction. By rating frequency and severity separately for the same fifteen problems, the present study shows that professionals perceive consultant-related problems as infrequent but capable of serious consequences. This suggests that interventions should be directed at consequences and at the highest-risk problems, such as geotechnical investigation, and not only at how widespread the problems are.

Table 6. Comparison of the present findings with previous studies.

Theme	Present study	Previous studies	Relationship
Geotechnical investigation	Most frequent problem (M = 2.42); second in severity (M = 4.20)	Some consultants omit comprehensive soil testing to reduce pre-contract costs (Odeyemi et al., 2019)	Consistent
Responsiveness and supervision	Delayed approvals, delayed responses to RFIs and weak supervision among the five most frequent problems	Consultant responsiveness and site presence are sources of delay and conflict (Ejohwomu et al., 2016; Tanko et al., 2017; Dosumu & Aigbavboa, 2019)	Consistent
Cost and rework consequences	Highest agreement that design errors and omissions increase costs (M = 4.50)	Inexperience, poor design and weak supervision lead to variations, delays and rework (Eze & Idiake, 2018; Jega et al., 2025)	Consistent

Theme	Present study	Previous studies	Relationship
Solutions	All fifteen technological, managerial and regulatory solutions strongly endorsed	Technology (Oke et al., 2021; Fagbenro et al., 2022; Aliu et al., 2025); project management practice (Unegbu et al., 2022); empowered project managers (Iroha et al., 2024)	Consistent
Overall frequency of problems	Low (overall M = 2.22)	Widespread client dissatisfaction with consultants (Dosumu & Aigbavboa, 2019; Oyeyipo et al., 2025)	Differs
Specialised building services expertise	Most severe problem (M = 4.23) but twelfth in frequency	Pervasive shortage of expertise (Oyeyipo et al., 2025)	Partly differs
ICT adoption	Least severe problem (M = 3.83), although agreed to slow communication (M = 4.25)	Major determinant of project performance (Ikediashi & Ogwueleka, 2016)	Differs
Unethical practice	High severity (M = 4.20) but low frequency (M = 2.08)	Serious and persistent problem (Adeyemo & Amade, 2016)	Partly differs

Source: Field survey (2026) and the studies cited.

A strength of the study is that three groups with different relationships to consultants (consultants, contractors and clients) were surveyed, which reduces the risk that the findings reflect the viewpoint of a single party. Frequency and severity were measured separately, and the impact of the problems was assessed on cost, time, quality and safety, with statements linked to the two theories adopted.

4 Conclusion

This study assessed the problems facing consultant engineers, their perceived effect on project performance and the support for technological, managerial and regulatory solutions among 60 professionals in Ibadan, Nigeria. Respondents regarded all fifteen consultant-related problems as infrequent but severe. Inadequate geotechnical investigation, delayed approvals and weak supervision were the most frequently reported, whereas lack of specialised building services expertise, inadequate geotechnical investigation and unethical practice were the most severe. The study therefore does not support a conclusion that these problems are widespread among the projects of the respondents; it supports the narrower conclusion that they are costly when they occur.

Respondents agreed strongly that the problems increase costs, delay delivery, reduce quality and create safety risks, with similar levels of agreement across the four dimensions, and that they are sustained by information asymmetry and weak enforcement, which is consistent with the Iron Triangle and Principal–Agent perspectives adopted. However, consultants were not regarded as the only source of poor project performance.

All fifteen solutions were strongly endorsed, with the most first-rank selections for minimum geotechnical investigation standards, stricter COREN enforcement and mandatory internal peer review, but the ranking data did not establish a priority order. Within these limits, the findings support the combined pursuit of technological, managerial and regulatory measures. The practical measures suggested by the findings are (i) sub-soil investigations appropriate to the height and complexity of each structure before design is finalised, without reliance on assumed bearing capacities; (ii) mandatory internal peer review of design documents, including a coordination check

across structural, architectural and building services drawings; (iii) defined response times for queries, sample approvals and payment certification, ideally through service level agreements with clients; (iv) early involvement of consultants, with clear authority on site and adequate budgetary provision for geotechnical investigation; and (v) consideration by COREN, working with the NSE, of minimum geotechnical investigation standards linked to building height and complexity.

The conclusions must be read in light of several limitations. The sample was small, purposive and drawn from one city, so the findings cannot be generalised beyond the respondents, and non-response may have affected the results. Most respondents worked on residential and commercial buildings, with few reporting road and highway projects. All data are self-reported perceptions, which may be affected by recent experience, professional loyalty and reluctance to report unethical conduct, and 36.7% of respondents were consultants rating their own profession. Differences between professional categories were not tested for significance. Finally, the ranking items did not discriminate between solutions, which indicates that ranking questions should enforce unique ranks where a priority order is required.

Future studies should use a larger and more balanced sample across several Nigerian cities and project types, including highways, with a forced-ranking or best–worst format so that priorities among solutions can be established. The integrated set of solutions should also be validated by experts, for example through a Delphi study or structured interviews with senior consultants, regulators and clients, and the effect of measures such as peer review, service level agreements and BIM on cost, time, quality and safety outcomes should be evaluated longitudinally in firms that adopt them.

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