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RESEARCH ARTICLE

Assessment Of Facility Maintenance Practices and Users' Satisfaction in Selected Academic Buildings of Imo State University, Owerri

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ABSTRACT

Effective facility maintenance is a critical determinant of building performance, user comfort, and institutional productivity, particularly in higher education settings. This study assessed facility maintenance practices and users' satisfaction in selected academic buildings of Imo State University, Owerri. Specifically, it examined maintenance strategies adopted, users' perceptions of facility conditions, levels of user satisfaction with maintenance services, and the influence of maintenance practices on satisfaction outcomes. A cross-sectional survey research design was employed, with structured questionnaires administered to a stratified sample of 298 respondents comprising students, academic staff, and non-academic staff across four selected buildings: the Faculty of Environmental Sciences Complex, the Main Library, the Architecture Studio, and the Physical Sciences lecture halls. Data were analysed using descriptive statistics and Spearman's Rank Correlation Coefficient at a 0.05 level of significance. Findings revealed a predominant reliance on reactive (corrective) maintenance strategies, with limited adoption of preventive or predictive approaches. Users expressed low satisfaction with facility conditions across key indicators — including structural condition, lighting, ventilation, sanitation, accessibility, safety, cleanliness, and maintenance responsiveness — with an overall mean satisfaction score of 2.51 out of 5.0. A statistically significant positive relationship was established between facility maintenance practices and users' satisfaction ($r_s = 0.614$; $p < 0.05$), leading to the rejection of the null hypothesis. The study recommends the institutionalisation of proactive maintenance frameworks, increased and ring-fenced budgetary allocation for facility upkeep, adoption of digital maintenance management systems, and the development of a robust facility management policy for the university.

Keywords: *Facility maintenance; Academic buildings; Built environment; IMSU*

1. INTRODUCTION

Buildings represent a significant proportion of the physical assets that constitute the built environment. They serve as essential infrastructure underpinning human activities, organisational productivity, and socio-economic development across

all sectors. As long-term capital assets, buildings require continuous management and systematic maintenance throughout their life cycle to remain functional, safe, sustainable, and responsive to the evolving needs of their users. The growing complexity of modern building systems, rising expectations for operational efficiency, environmental sustainability, and occupant comfort have collectively elevated the strategic importance of facility management and maintenance practices in contemporary built environment discourse (ISO 41011, 2017; Mahmoud, Hassanain, & Alshibani, 2024).

Facility management is broadly defined as a strategic, interdisciplinary discipline that integrates people, place, processes, and technology to enhance the operational performance of built assets and optimise the experiences of their users (ISO 41011, 2017). Within this framework, maintenance constitutes a core functional domain that directly affects building performance, serviceability, and longevity. Maintenance encompasses a range of technical, administrative, and managerial actions designed to retain facilities in, or restore them to, required functional conditions. Recognised maintenance strategies have evolved considerably — from traditional reactive (corrective) approaches that address failures after their occurrence, to more proactive preventive, predictive, and condition-based models that seek to anticipate and avert failures (Chikafalimani et al., 2021). These advances have been further supported by emerging technologies such as Building Information Modelling (BIM), Artificial Intelligence (AI), and the Internet of Things (IoT), which are progressively transforming maintenance management practice (Mahmoud et al., 2024).

In higher education institutions, the role of facility maintenance is of heightened significance, given the diverse and multifunctional character of academic buildings that support teaching, learning, research, and community service. Research consistently demonstrates that well-maintained facilities contribute to the creation of conducive learning environments by sustaining quality infrastructure and appropriate indoor environmental conditions (Mahmoud et al., 2024). Key environmental and physical factors — including structural integrity, lighting quality, ventilation adequacy, sanitation standards, accessibility, safety provisions, and general cleanliness — have been shown to directly affect teaching effectiveness, staff productivity, student engagement, and institutional reputation (Mormah, 2023; Mahmoud et al., 2024).

Despite growing recognition of facility maintenance as a strategic function, many higher education institutions in developing countries face persistent challenges that undermine effective maintenance practice. These include inadequate funding, weak or absent maintenance policies, widespread culture of deferred maintenance, acute skills shortages, poor maintenance culture, and an over-reliance on corrective approaches (Chikafalimani et al., 2021; Desbalo, 2024; Mormah, 2023). In Nigeria, public universities face particularly severe challenges, including aging infrastructure, rapidly rising student populations, and chronically limited maintenance budgets, resulting in significant deficiencies in maintenance planning, service delivery, and user satisfaction (Mormah, 2023).

Imo State University (IMSU), Owerri, is a prominent public university in southeastern Nigeria that depends heavily on its academic facilities to deliver on its core mandate of teaching, research, and community engagement. Notwithstanding its institutional importance, limited empirical evidence exists on the effectiveness of current facility maintenance practices within the university's academic buildings, or on the resulting impact on the satisfaction of building users. While prior studies have examined aspects of facility management in other Nigerian universities, few have specifically investigated the relationship between maintenance practices and users' satisfaction within the unique institutional context of Imo State University. This study addresses that empirical gap by systematically assessing facility maintenance practices and users' satisfaction in four selected academic buildings: the Faculty of Environmental Sciences Complex, the Main Library, the Architecture Studio, and the Physical Sciences large lecture halls and classrooms.

Functional and well-maintained academic facilities are a prerequisite for higher education institutions to effectively achieve their core objectives of advancing knowledge, facilitating learning, and engaging communities. However, many public universities in developing countries, including Nigeria, are characterised by deteriorating infrastructure resulting from a convergence of inadequate funding, long-standing deferred maintenance, entrenched reactive maintenance cultures, and weak institutional governance of facility management (Chikafalimani et al., 2021; Desbalo, 2024; Mormah, 2023). These systemic deficiencies manifest physically in defective structural and building components, poor indoor environmental conditions, substandard sanitation facilities, and generally reduced building functionality — all of which adversely affect user comfort, academic productivity, and overall satisfaction.

Users' satisfaction has emerged as a critical indicator of maintenance effectiveness and overall facility performance. It is shaped by a complex interplay of factors including building physical condition, cleanliness and hygiene standards, adequacy of lighting, ventilation quality, safety and security provisions, accessibility, and the responsiveness of maintenance service delivery (Mahmoud et al., 2024). At Imo State University, Owerri, there is currently an absence of sufficient empirical data on users' perceptions of facility conditions, their levels of satisfaction with maintenance services, and the nature and extent of the influence that current maintenance practices exert on the academic learning environment. This knowledge gap constitutes a significant impediment to evidence-based decision-making in maintenance planning, resource allocation, and policy development within the institution. Consequently, a systematic assessment of facility maintenance practices and users' satisfaction in the selected academic buildings is both timely and necessary.

The aim of this study is to assess facility maintenance practices and users' satisfaction in selected academic buildings of Imo State University, Owerri, with a view to enhancing the quality of the learning environment and improving facility management effectiveness within the university. In pursuance of the foregoing aim, the study specifically sought to:

i. assess the facility maintenance practices adopted in the selected academic buildings of Imo State University, Owerri;
ii. assess users' perceptions of the physical condition of facilities in the selected buildings;
iii. determine the level of users' satisfaction with facility maintenance services in the selected academic buildings;
iv. evaluate the influence of facility maintenance practices on users' satisfaction in the selected buildings; and
v. recommend strategies for improving facility maintenance practices and enhancing users' satisfaction within the university.

The following null hypothesis was formulated for empirical testing at a 0.05 level of significance:

H_{01}: There is no significant relationship between facility maintenance practices and users' satisfaction in selected academic buildings of Imo State University, Owerri.

The findings of this study are anticipated to be of significant value to multiple stakeholders, including university management, facility managers, built environment professionals, policymakers, and the broader academic research community. At the institutional level, the study provides Imo State University management with rigorous empirical evidence to guide strategic maintenance planning, inform resource allocation decisions, and provide an evidence base for the development of robust facility management policies tailored to the university's operational realities.

For facility managers and maintenance personnel, the study offers practical insights into the adoption of more proactive and systematic maintenance strategies, as well as opportunities for improved resource utilisation in the delivery of facility services (Desbalo, 2024). Built environment professionals — including architects, estate surveyors, quantity surveyors, and civil engineers — are encouraged by the findings to give greater priority to maintainability considerations and user needs at the design and construction stages of academic buildings. At the policy level, educational administrators and government policymakers receive evidence-based recommendations applicable to the broader challenge of improving facility management standards across public universities in Nigeria. The study also contributes to the body of scholarly literature on the relationship between effective maintenance practice, building performance, and user satisfaction in higher education environments (Mahmoud et al., 2024; Mormah, 2023).

This study is focused on the assessment of facility maintenance practices and users' satisfaction in selected academic buildings of Imo State University, Owerri, Imo State, Nigeria. The study is restricted to four selected academic buildings: the Faculty of Environmental Sciences Complex, the Main Library, the Architecture Studio, and the Physical Sciences large lecture halls and classrooms. The selection of these facilities was informed by their functional diversity, high occupancy rates, and centrality to the daily academic experiences of students and staff.

The assessment focused on building components and environmental services that directly bear on user experience, including structural condition, lighting, ventilation, sanitation, accessibility, safety, cleanliness, and maintenance responsiveness. Participants comprised students, academic staff, and non-academic staff who regularly use the selected buildings. The study excludes residential facilities, staff quarters, commercial areas, sports facilities, and non- academic buildings. It does not extend to detailed structural engineering assessments or financial analysis of maintenance expenditures.

2. LITERATURE REVIEW

Conceptual Framework of Facility Management and Maintenance

The concept of facility management has undergone significant definitional evolution over the past three decades, shifting from a predominantly operational and technical function to a recognised strategic management discipline. The International Organisation for Standardisation (ISO 41011:2017) defines facility management as an organisational function that integrates people, place, and process within the built environment to improve the quality of life of people and the productivity of the core business. This definition underscores the multidimensional and people-centred character of facility management, positioning it as a discipline with far-reaching implications for organisational performance and user experience. Within this broader management framework, building maintenance is identified as one of the most critical operational domains, concerned with sustaining the physical condition, functionality, and serviceability of built assets across their useful life cycle (Chikafalimani et al., 2021).

The British Standard BS 3811:1993 defines maintenance as the combination of all technical and administrative actions, including supervision, intended to retain an item in, or restore it to, a state in which it can perform a required function. This technical definition has been widely adopted in the built environment literature and forms the conceptual anchor for most empirical studies on building maintenance management. More recently, scholars have proposed broader conceptualisations that account for the socio-organisational dimensions of maintenance, including its impact on user satisfaction, institutional performance, and sustainability outcomes (Hauashdh et al., 2020; Mahmoud et al., 2024). These contemporary perspectives are particularly relevant to academic building contexts, where the relationship between physical facility conditions and user wellbeing is especially pronounced.

Types and Strategies of Building Maintenance

The built environment literature identifies several distinct maintenance strategies, each characterised by differing trigger mechanisms, cost implications, and effectiveness outcomes. These strategies are broadly categorised into reactive and proactive approaches, with further sub- classifications that reflect increasing levels of technical sophistication and managerial maturity.

Reactive (Corrective) Maintenance

Reactive maintenance involves the repair or restoration of building components or systems after failure has occurred. It is the most basic and historically prevalent maintenance strategy, particularly in public institutions characterised by constrained budgets and weak maintenance governance frameworks (Chikafalimani et al., 2021). While reactive maintenance may appear cost-effective in the short term, the literature consistently demonstrates that it leads to higher long-term expenditures, accelerated asset deterioration, and increased user dissatisfaction (Desbalo, 2024; Mormah, 2023). The predominantly reactive maintenance culture documented across Nigerian public universities is a critical factor underlying the widespread decline of academic building quality observed in the literature.

Preventive Maintenance

Preventive maintenance involves the scheduling of maintenance tasks at predetermined intervals or based on prescribed usage criteria, with the explicit aim of preventing the occurrence of failure and prolonging the serviceable life of building components and systems. Planned preventive maintenance (PPM) programmes typically encompass routine inspections, cleaning schedules, lubrication, minor adjustments, and component replacements conducted on a systematic and time-based basis (Hauashdh et al., 2020). The adoption of preventive maintenance has been shown to reduce breakdown frequency, lower overall lifecycle costs, and contribute positively to user satisfaction. However, effective implementation requires adequate funding, trained personnel, and robust management information systems — resources frequently deficient in public university settings in developing countries (Desbalo, 2024).

Predictive and Condition-Based Maintenance

Predictive maintenance employs continuous or periodic monitoring of building systems and components to detect early indicators of potential failure, enabling timely intervention before breakdown occurs. Condition-based maintenance (CBM) similarly relies on real-time data from sensors and inspection reports to trigger maintenance actions when performance thresholds are approached or exceeded. These advanced strategies, increasingly facilitated by technologies such as Building Information Modelling (BIM), the Internet of Things (IoT), and Artificial Intelligence (AI)-powered diagnostic systems, represent the frontier of contemporary maintenance management practice (Mahmoud et al., 2024). While their adoption remains largely confined to well-resourced institutions in developed economies, growing scholarly attention signals an important direction for future practice in developing country contexts.

Facility Maintenance in Higher Education Institutions

Academic buildings constitute a specialised and particularly demanding category within the broader built environment, characterised by high occupancy densities, diverse functional requirements, extended operational hours, and the need to maintain conducive environments for teaching, learning, and research. These characteristics create unique maintenance challenges that distinguish higher education facilities from commercial, residential, or industrial buildings (Olanrewaju & Idrus, 2020). The literature identifies a robust and consistent relationship between the physical condition of educational facilities and institutional outcomes, including student academic performance, teaching effectiveness, staff productivity, and overall user satisfaction (Earthman, 2017; Higgins et al., 2005).

Studies conducted across diverse higher education contexts — including Ghana, Ethiopia, Malaysia, and Saudi Arabia — consistently document that inadequate maintenance of academic buildings adversely affects indoor environmental quality, including thermal comfort, air quality, acoustic conditions, and visual comfort, all of which are critical determinants of learning environment quality (Desbalo, 2024; Mahmoud et al., 2024; Olanrewaju & Idrus, 2020). In the Nigerian higher education context, Mormah (2023) documented widespread infrastructure deterioration across selected Nigerian public universities, attributing the decline to chronic underfunding, absence of maintenance policies, and an entrenched culture of deferred maintenance. Chikafalimani et al. (2021) similarly found that Nigerian universities predominantly rely on reactive maintenance strategies, with limited capacity for preventive or predictive approaches.

Users' Satisfaction in the Built Environment

Users' satisfaction in built environment contexts has been conceptualised as a cognitive and affective evaluative response by building occupants to the perceived match between their expectations and the actual performance of the facility (Preiser, 1995). It represents a summative judgement about the suitability, quality, and functionality of a building from the perspective of those who use it, and serves as a key outcome variable in post-occupancy evaluation (POE) research. The Post-Occupancy Evaluation framework provides a systematic methodological approach for assessing building performance in use, with user satisfaction constituting a central evaluative criterion (Preiser et al., 1988).

The determinants of user satisfaction in academic built environments are multi-factorial. Mahmoud et al. (2024) identified the following as the most consistently cited satisfaction determinants: structural and aesthetic condition of building fabric, adequacy and quality of artificial and natural lighting, thermal comfort and ventilation effectiveness, sanitation and restroom hygiene, accessibility and circulation, safety and security provisions, cleanliness and general housekeeping standards, and maintenance responsiveness. These factors correspond closely to the physical attributes most directly influenced by maintenance quality, establishing a theoretically grounded basis for examining the maintenance-satisfaction relationship. Empirically, Hassanain et al. (2019) found significant positive correlations between preventive maintenance adoption and user satisfaction scores in Saudi Arabian university buildings, while Desbalo (2024) established that reactive maintenance dominance was the strongest predictor of low user satisfaction in the Ethiopian higher education context.

Theoretical Framework

This study is anchored in two complementary theoretical frameworks: the Post- Occupancy Evaluation (POE) Theory and the SERVQUAL Model of Service Quality. The POE theory provides a systematic framework for evaluating the performance of buildings in relation to the needs and expectations of their users, encompassing technical, functional, and behavioural performance dimensions (Preiser, 1995). In the context of this study, POE theory underpins the assessment of facility conditions and user satisfaction as reflections of maintenance effectiveness.

The SERVQUAL model, developed by Parasuraman, Zeithaml, and Berry (1988), conceptualises service quality as the gap between user expectations and perceived service delivery performance across five dimensions: reliability, assurance, tangibles, empathy, and responsiveness. Adapted to the facility maintenance context, SERVQUAL provides a conceptual lens for understanding users' satisfaction with maintenance services in terms of the reliability of maintenance interventions, the tangible quality of building conditions, and the responsiveness of maintenance personnel to reported defects. The integration of these two frameworks provides a theoretically coherent and practically applicable foundation for the methodology and analytical approach of this study.

Gap in Literature

The foregoing review of literature demonstrates that, while considerable scholarly attention has been devoted to facility maintenance and user satisfaction in higher education globally, empirical investigations specific to Nigerian university contexts remain comparatively sparse. More critically, no study has been identified in the available literature that specifically addresses the relationship between facility maintenance practices and users' satisfaction in the academic buildings of Imo State University, Owerri. This contextual and empirical gap is significant, given the university's status as a major public institution in southeastern Nigeria and the unique maintenance challenges associated with its built environment. The present study is therefore positioned to make an original and contextually relevant contribution to the existing body of knowledge.

3. MATERIALS AND METHODS

Research Design

This study adopted a cross-sectional survey research design, which is appropriate for collecting data at a single point in time from a defined population to describe, explain, or assess the prevalence and relationships of study variables (Creswell, 2014). The cross-sectional design is widely employed in built environment and facility management research for its capacity to generate representative and generalisable findings within resource and time constraints (Mahmoud et al., 2024). The study integrated quantitative methods as its primary data collection and analysis strategy, supplemented by direct physical observation of the selected facilities to corroborate survey responses and triangulate findings.

Study Area

The study was conducted at Imo State University, Owerri, located in Owerri, Imo State, southeastern Nigeria. Founded in 1981, Imo State University is one of the prominent state-owned universities in southeastern Nigeria, with a student population of approximately 30,000 and a diverse range of academic programmes spanning the sciences, humanities, social sciences, and professional disciplines. The Faculty of Environmental Sciences — home to the Departments of Architecture, Estate Management, Quantity Surveying, and Urban and Regional Planning — houses several of the buildings examined in this study. The four selected academic buildings were chosen for their functional diversity, high occupancy rates, and centrality to the daily academic experiences of students and staff.

Population and Sampling

The target population comprised all regular users of the four selected academic buildings, including undergraduate and postgraduate students, academic staff, and non-academic staff. Based on available institutional records and direct enumeration, the estimated total user population across the four buildings was approximately 1,200 persons during the period of study. A stratified random sampling technique was employed to ensure proportional representation of the three user categories across each building. Using the Taro Yamane (1967) formula for sample size determination at a 95% confidence level and a 5% margin of error, a minimum sample size of 300 respondents was determined. Ultimately, 320 copies of the questionnaire were administered, of which 298 were returned and found suitable for analysis, representing a response rate of 93.1%.

Table 1. Distribution of Sample across Buildings and User Categories

Academic Building	Students	Academic Staff	Non-Academic Staff	Total (n)
Fac. of Environmental Sciences Complex	70	20	15	105
Main Library	55	15	10	80
Architecture Studio	40	12	8	60
Physical Sciences Lecture Halls	38	10	5	53
Total	**203**	**57**	**38**	**298**

Data Collection Instrument

The primary data collection instrument was a structured, self-administered questionnaire developed from an extensive review of related literature and validated through a pilot study involving 20 respondents drawn from buildings not included in the main study. The questionnaire was organised into four sections. Section A elicited socio-demographic information from respondents. Section B assessed the maintenance practices adopted in the selected buildings, using a five-point Likert scale (1 = Never; 5 = Always). Section C assessed users' perceptions of physical facility conditions across eight indicators, using a five-point scale (1 = Very Poor; 5 = Very Good). Section D assessed users' overall satisfaction with facility maintenance services using a five-point satisfaction scale (1 = Very Dissatisfied; 5 = Very Satisfied). Content validity was confirmed through expert review by two facility management academics, while internal reliability was assessed using Cronbach's Alpha, yielding a coefficient of 0.84 — indicating high internal consistency. Physical observation was additionally conducted using a structured building condition checklist adapted from the Facilities Condition Index (FCI) framework.

Data Analysis

Quantitative data from returned questionnaires were coded and analysed using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive statistical tools — including frequencies, percentages, means, and standard deviations — were employed to summarise respondents' profiles, maintenance practices, facility condition perceptions, and satisfaction levels. Mean scores were interpreted with a decision cut-off of 3.0, where scores below 3.0 indicated low adoption, poor condition, or dissatisfaction, and scores at or above 3.0 indicated moderate to high adoption, good condition, or satisfaction. The null hypothesis was tested using Spearman's Rank Correlation Coefficient, at a 0.05 level of significance. Findings from the building condition observation were presented as a descriptive narrative to triangulate and enrich the interpretation of survey results.

4. RESULTS AND DISCUSSION

Socio-Demographic Profile of Respondents

Of the 298 valid respondents, 203 (68.1%) were students, 57 (19.1%) were academic staff, and 38 (12.8%) were non-academic staff. Males constituted 61.4% of the sample (n=183) and females 38.6% (n=115). The majority of respondents (74.8%) had used their respective buildings for more than two years, indicating substantial familiarity with the facilities and lending credibility to their perceptions and satisfaction assessments.

Facility Maintenance Practices in Selected Academic Buildings

Respondents were asked to assess the frequency of adoption of various maintenance practices in the selected buildings. Table 2 presents the mean scores and standard deviations for each maintenance type, ranked in descending order of frequency of adoption.

Table 2. Frequency of Adoption of Maintenance Practices (n=298)

S/N	Maintenance Practice	Mean	SD	Rank
1	Reactive/corrective maintenance (repair after failure)	4.21	0.63	1st
2	General cleaning and housekeeping	3.88	0.74	2nd
3	Minor repairs and ad hoc interventions	3.64	0.81	3rd
4	Periodic inspection of building components	2.73	0.92	4th
5	Planned preventive maintenance routines	2.41	0.88	5th
6	Scheduled servicing of electrical/MEP systems	2.18	0.95	6th
7	Condition-based or predictive	1.62	0.71	7th
8	Use of digital maintenance management systems	1.34	0.58	8th
	Overall Mean	2.75		

The results in Table 2 reveal a clear predominance of reactive/corrective maintenance in the selected academic buildings, with the highest mean score of 4.21 (SD=0.63). General cleaning and housekeeping ranked second (mean=3.88), followed by minor ad hoc repairs (mean=3.64). In contrast, planned preventive maintenance (mean=2.41), condition-based maintenance (mean=1.62), and digital maintenance management systems (mean=1.34) were among the least frequently adopted practices. The overall mean score of 2.75 — below the cut- off of 3.0 — indicates a generally low and reactive maintenance culture across the selected buildings. These findings are consistent with Mormah (2023) and Chikafalimani et al. (2021), who similarly documented reactive maintenance dominance in Nigerian public universities, attributing the pattern to chronic funding deficits and the absence of formal maintenance policies. The near-absence of predictive and technology-aided maintenance strategies reflects a significant gap in maintenance management capacity, aligned with Mahmoud et al.'s (2024) observation that digital maintenance tools remain largely unadopted in sub-Saharan African higher education institutions.

Users' Perceptions of Physical Facility Conditions

Table 3 presents users' perceptions of the physical condition of facilities across eight key indicators in the selected buildings.

Table 3. Users' Perceptions of Physical Facility Conditions (n=298)

S/N	FACILITY CONDITION INDICATOR	MEAN	SD	REMARK
1	Structural/building fabric condition	2.61	0.87	Poor
2	Adequacy of natural and artificial lighting	2.88	0.91	Poor
3	Ventilation and indoor air quality	2.53	0.94	Poor
4	Sanitation and restroom hygiene	2.21	1.03	Poor
5	Accessibility and ease of circulation	3.12	0.82	Moderate
6	Safety and security provisions	2.74	0.96	Poor
7	General cleanliness	2.96	0.88	Poor
8	Responsiveness of maintenance services	2.14	1.07	Poor
	OVERALL MEAN	**2.65**		**POOR**

Table 3 indicates that users rated the physical condition of the selected buildings as predominantly poor across most indicators. Sanitation and restroom hygiene recorded the lowest mean score (2.21), followed by responsiveness of maintenance services (2.14) — the two areas most directly dependent on active and consistent maintenance management. Structural and building fabric condition (mean=2.61), ventilation and indoor air quality (mean=2.53), and safety provisions (mean=2.74) also fell below the acceptable threshold. Only accessibility and ease of circulation achieved a mean above the cut-off (3.12). The overall mean perception score of 2.65 confirms a broadly poor assessment of physical facility conditions. Physical observation of the buildings corroborated these survey findings. Visible evidence of deferred maintenance was noted in all four buildings, including cracked and stained wall plaster, peeling ceiling finishes, non-functional lighting fixtures, blocked drainage channels, damaged or absent toilet fittings, broken windows and doors, and deteriorated floor finishes. The Architecture Studio exhibited the most advanced state of fabric deterioration, with evidence of water infiltration through

the roof, while the Physical Sciences lecture halls were characterised by overcrowding, poor ventilation, and inadequate artificial lighting, consistent with the qualitative findings of Mormah (2023).

Level of Users' Satisfaction with Facility Maintenance Services

Table 4 presents the overall levels of user satisfaction with facility maintenance services across the selected buildings.

Table 4. Users' Satisfaction with Facility Maintenance Services (n=298)

S/N	Satisfaction Indicator	Mean	SD	Remark
1	Satisfaction with building structuralcondition	2.44	0.91	Dissatisfied
2	Satisfaction with lighting conditions	2.72	0.88	Dissatisfied
3	Satisfaction with ventilation/thermal comfort	2.38	0.97	Dissatisfied
4	Satisfaction with sanitation facilities	2.09	1.01	Dissatisfied
5	Satisfaction with accessibility/circulation	3.08	0.78	Satisfied
6	Satisfaction with safety/securitymeasures	2.56	0.93	Dissatisfied
7	Satisfaction with cleanlinessstandards	2.81	0.86	Dissatisfied
8	Satisfaction with maintenanceresponse time	2.03	1.09	Dissatisfied
	Overall Mean Satisfaction	**2.51**		**Dissatisfied**

SD = Standard Deviation; Dissatisfied: Mean < 3.0; Satisfied: Mean ≥ 3.0

Table 4 reveals that users expressed dissatisfaction with facility maintenance services across seven of the eight assessed indicators. Satisfaction with maintenance response time (mean=2.03) and sanitation facilities (mean=2.09) attracted the lowest scores, reflecting users' frustration with both the speed and quality of maintenance interventions. Satisfaction with ventilation and thermal comfort (mean=2.38), building structural condition (mean=2.44), and safety provisions (mean=2.56) similarly indicated dissatisfaction. The sole indicator above the cut-off was accessibility and ease of circulation (mean=3.08), mirroring the corresponding pattern observed in Table 3. The overall mean satisfaction score of 2.51 confirms a generally low level of user satisfaction with facility maintenance services. These results align with comparable findings from sub-Saharan Africa: Desbalo (2024) reported an overall mean satisfaction score of 2.43 in Ethiopian public university buildings characterised by reactive maintenance dominance, while Mormah (2023) documented widespread dissatisfaction among Nigerian university users. The particularly low satisfaction scores for maintenance response time are consistent with Mahmoud et al.'s (2024) observation that responsiveness is the SERVQUAL dimension most acutely affected by the absence of formal maintenance management systems.

Influence of Facility Maintenance Practices on Users' Satisfaction

To evaluate the influence of facility maintenance practices on users' satisfaction, Spearman's Rank Correlation Coefficient analysis was conducted between composite maintenance practice adoption scores and overall user satisfaction scores. The results are presented in Table 5.

Table 5. Spearman's Rank Correlation — Maintenance Practices and Users' Satisfaction

Variable Pair	N	rs	p-value	Decision on H_{0}
Maintenance Practices ↔ Users'Satisfaction	298	0.614	0.000	Reject H_{0}

*rs = Spearman's Rank Correlation Coefficient *Significant at p < 0.05*

The Spearman's Rank Correlation analysis yielded a coefficient of rs = 0.614 with a p- value of 0.000, which is less than the 0.05 significance threshold. The null hypothesis (H_{01}) — that there is no significant relationship between facility maintenance practices and users' satisfaction in selected academic buildings of Imo State University, Owerri — is therefore rejected. The positive and moderately strong correlation coefficient indicates that higher levels of adoption of systematic and proactive maintenance practices are significantly associated with improved levels of user satisfaction. This finding provides empirical support for the theoretical propositions of the Post-Occupancy Evaluation framework and the SERVQUAL model, both

of which posit direct relationships between the quality of facility management service delivery and user satisfaction outcomes. The strength of the observed relationship ($r_s = 0.614$) is consistent with comparable findings in the literature: Hassanain et al. (2019) reported a correlation of 0.58 in Saudi Arabian university facilities, and Desbalo (2024) found a correlation of 0.67 in Ethiopian higher education contexts. The significant and positive directionality of the relationship powerfully underscores the case for investing in more proactive and systematic maintenance management approaches at Imo State University.

5. CONCLUSION

This study has provided a systematic and empirically grounded assessment of facility maintenance practices and users' satisfaction in four selected academic buildings of Imo State University, Owerri. The findings reveal a maintenance management landscape characterised by a near-exclusive reliance on reactive and corrective maintenance strategies, with negligible adoption of preventive, predictive, or technology-aided approaches. Users across all four buildings expressed predominantly poor perceptions of physical facility conditions, with sanitation, ventilation, structural integrity, and maintenance responsiveness attracting the lowest ratings. Correspondingly, overall user satisfaction with facility maintenance services was low, with a mean satisfaction score of 2.51 on a five-point scale — well below the acceptable threshold. The Spearman's Rank Correlation analysis confirmed a statistically significant positive relationship between maintenance practice adoption and users' satisfaction ($r_s = 0.614$, $p < 0.05$), leading to the rejection of the null hypothesis.

These findings indicate that the current state of facility maintenance management in the selected IMSU academic buildings is inadequate to meet user expectations and to support a conducive academic learning environment. The reactive maintenance culture, compounded by limited funding, weak institutional maintenance policies, and the absence of digital facility management tools, is a primary driver of the low satisfaction levels documented among building users. The implications extend beyond the immediate built environment, touching on the quality of the academic experience, institutional reputation, and the long-term sustainability of the university's physical assets.

Based on the findings and conclusions of this study, the following recommendations are advanced for the attention of Imo State University management, facility managers, policymakers, and other relevant stakeholders:

The University management should develop and implement a comprehensive Planned Preventive Maintenance (PPM) programme for all academic buildings, establishing scheduled inspection and

maintenance routines for critical building systems including structural elements, electrical installations, mechanical and plumbing services, and building fabric. This shift from reactive to preventive maintenance is the most impactful single action available to improve both facility conditions and user satisfaction.

Imo State University should formulate and adopt a formal, written facility management policy that clearly defines maintenance standards, accountability frameworks, funding mechanisms, and performance indicators for academic building maintenance — providing the institutional governance foundation necessary for systematic and effective maintenance management.

Government and university authorities should commit to substantially increased, dedicated, and ring-fenced budgetary allocations for facility maintenance. Priority investment should target the rectification of the most critical deficiencies identified in this study: sanitation facilities, ventilation systems, structural fabric repair, and safety provisions.

The university should explore the adoption of accessible and affordable Computerised Maintenance Management Systems (CMMS) to enhance maintenance planning, scheduling, work order management, and performance tracking — thereby improving maintenance responsiveness, identified in this study as the lowest-rated satisfaction dimension.

Investment in the training and professional development of maintenance staff should be prioritised, equipping personnel with competencies for systematic preventive maintenance, building services management, and the use of digital maintenance tools. Collaboration with the Departments of Architecture, Estate Management, and Quantity Surveying within the Faculty of Environmental Sciences could provide a productive avenue for knowledge transfer and research-practice synergy.

A formal, institutionalised mechanism for eliciting, recording, and responding to user feedback on facility conditions and maintenance services should be established. Regular

Evaluations of academic buildings, conducted at minimum biennially, would provide ongoing, evidence-based insights into evolving user needs and maintenance priorities.

Contribution to Knowledge

This study makes original contributions to the scholarly literature on facility management in higher education. It provides the first empirically grounded assessment of facility maintenance practices and users' satisfaction specifically within the built environment of Imo State University, Owerri — an important institutional context hitherto unexamined in the published literature. The study demonstrates the applicability of the combined Post-Occupancy Evaluation and SERVQUAL theoretical frameworks in the Nigerian university facility management context, and provides a replicable methodological template for similar investigations across other public universities in southeastern Nigeria and the broader sub-Saharan African region. Furthermore, the quantified maintenance-satisfaction relationship ($r_s = 0.614$, $p < 0.05$) adds to the growing body of international empirical evidence on the nexus between maintenance management quality and user satisfaction in the academic built environment.

6. COMPETING INTERESTS

None to declare.

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