Published: 14th October 2026

INTERNATIONAL JOURNAL OF REAL ESTATE

ISSN: 2476-8073

MAINTENANCE CHALLENGES AND EFFECTIVE FACILITY MANAGEMENT IN SELECTED PRIVATE UNIVERSITIES IN EDO STATE, NIGERIA

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DOI: https://doi.org/10.5281/zenodo.23366626

Abstract

The need for effective facility management is vital to ensure that the physical infrastructure of universities is functional, safe and sustainable. In higher education institutions, however, maintenance operations can be constrained by poor planning, poor coordination, lack of skilled staff, slow response to maintenance needs, weak supervision and ineffective implementation of maintenance policies. This study examined perceived maintenance challenges, and compared their ratings across selected private universities in Edo State, Nigeria, with implications for effective facility management. The study adopted a quantitative, descriptive cross-sectional survey design. Four private universities, namely Glorious Vision University, Mudiame University, Benson Idahosa University and Wellspring University, were surveyed using questionnaires administered to maintenance personnel. A total of 175 questionnaires were distributed and 156 were retrieved and analysed, giving an 89.14% response rate. Descriptive statistics (frequencies, percentages, means and standard deviations) were used to analyse the data, and one-way Analysis of Variance (ANOVA) was used to test the null hypothesis that there is no significant difference in the mean ratings of maintenance challenges across the four universities, at the 0.05 level of significance. The descriptive results indicated high agreement that inadequate maintenance planning, poor coordination between maintenance units, lack of skilled staff, delayed response to maintenance problems, weak supervision and poor implementation of maintenance policies are important challenges. The grand mean across the six challenge indicators was 4.59 ($SD = 0.52$). The ANOVA showed that mean ratings differed significantly across the universities, $F(3, 152) = 10.879$, $p < 0.001$; hence, the null hypothesis was rejected. The findings indicate that perceived maintenance challenges differ significantly between the selected universities. Because facility management effectiveness was not measured directly, the study does not establish a relationship between these challenges and facility management effectiveness. The study recommends improved maintenance planning, proper coordination, sufficient technical staffing, quick response mechanisms and enforcement of maintenance policies in private universities.

Keywords: Facility management, Maintenance challenges, Maintenance management, Nigeria, Private universities, University facilities.

1. Introduction

Physical facilities and infrastructure are crucial to the teaching, learning, research, administration and other activities of Universities. There is a need to constantly oversee and maintain buildings, lecture theatres, laboratories, offices, hostels, electrical installations, water systems, roads, mechanical equipment and other physical assets to ensure that they continue to function. The built environment refers to all the man-made items used in buildings, in external works, in infrastructure and other construction works; infrastructure refers to facilities, equipment and services which are used within an organisation's operations (ISO, 2017). Therefore, facility management is a systematic process that enables the integration of people, place and processes in the built environment in a way that is conducive to the achievement of the organisational goals (ISO, 2024). As universities are expanding their physical footprint and offering more specialised academic and support services, the relevance of the role of facility management has grown even more apparent. Organisations can create and keep effective learning spaces, facilitate learning activities and enhance the life cycle management and performance of their physical assets when facilities are managed effectively. According to ISO 41011, some of the outcomes of facility management are improved quality and productivity, functional environments, regulatory compliance, and optimisation of life-cycle performance and costs (ISO, 2017). On the other hand, poor maintenance can increase maintenance needs, disrupt organisational activities and cause equipment deterioration. Research focused on Nigeria specifically has revealed that poor maintenance budget and poor strategic planning are important challenges to maintenance management of facilities in higher education institutions in Nigeria (Olowoake, 2015).

There are multiple sources of challenges for maintenance. These are poor planning within maintenance, lack of coordination between the maintenance staff, lack of technically skilled employees, lack of quick response to reported faults, poor supervision and weak implementation of maintenance policies. Such challenges may prevent maintenance departments from moving from reactive approaches towards more systematic and preventive approaches. Maintenance implementation challenges in Nigerian public universities were identified during the review and these challenges include lack of maintenance policy, maintenance culture, shortage of building facilities and overpopulation (Yusuf and Asmoni, 2022). Other studies conducted in Nigerian higher education institutions (HEIs) have investigated maintenance methods, maintenance budgeting and procedures for the submission of maintenance complaints, which underscores the significance of systematic maintenance-management processes in HEIs (Ajiero et al., 2022).

Maintenance management has been recognised as a key factor in the performance and sustainability of institutional buildings. Parida and Kumar (2006) highlight the importance of suitable performance measures for maintenance, in the context of maintenance effectiveness. Maintenance performance, as argued by Muchiri et al. (2011), should be accompanied by systematic indicators that would be able to assess maintenance activities and their impact on the performance of the organisation. The management of facilities in higher education is a specific problem since universities are equipped with a variety of building types, technical installations and users with different operating needs.

Studies in the Nigerian university environment have also found some shortcomings in the building maintenance operations. Ugwu et al. (2018), for instance, discussed the issue of building maintenance in the Nigerian university system with a view of improving maintenance management. Odeyemi et al. (2019) carried out a study on building maintenance in a university in Nigeria and showed that building maintenance is still relevant and requires systematic approach. Ofor-Douglas (2022) discussed the physical resource management and maintenance culture in Nigerian Universities and noted the significance of maintenance practices in managing physical resources

in the Universities. In recent times, Osuizugbo and Olusanya (2023) reviewed maintenance management practices and challenges of private university buildings in Ogun State, Nigeria.

While the available literature provides some evidence, there is a need for the context-specific empirical evidence on the private universities in Edo State. Private universities come in various sizes and different management structures, are located in different geographical areas, have different levels of resources and maintenance policies etc. Moreover, evidence on how maintenance challenges are perceived across the private universities of Edo State is still limited.

Thus, the present study is restricted to the maintenance challenges identified by maintenance staff in four selected private universities in Edo State. It does not seek to explore the effect of funding, user attitudes or regular inspection. It focuses specifically on how maintenance challenges are perceived by maintenance personnel and whether these perceptions differ across the selected universities.

University facilities are significant investments, and must be maintained on an on-going basis. But with poorly planned, coordinated, supervised and implemented maintenance activities, the effectiveness of the facility management can be undermined. These exist in practice in maintenance departments in the form of delay in response to reported faults, lack of technical staff, lack of coordination among the maintenance units and lack of institutional support for maintenance policies.

This can lead to a progressive decline in facilities and can add to maintenance departments' workloads. If maintenance issues go unresolved and unaddressed at an early stage, they can escalate into more significant issues. Likewise, if the coordination is not effective, there can be duplication of activities, delays or inefficient utilisation of available personnel and resources.

This is an important issue for private universities, as optimal use of physical resources is essential to the academic and administrative processes. Although studies have been conducted on maintenance practices among the universities in Nigeria, studies that consider specifically the challenges that face selected private universities in Edo State have been limited. This study addresses this gap by examining perceived maintenance challenges, and differences in their ratings, across four selected private universities in Edo State, with implications for effective facility management.

2. Literature Review

2.1 Concept of Facility Management

Facility management is the management of the buildings, infrastructure, people and services and supporting processes in a coordinated way to ensure that the physical environment supports the operation of the organisation. In a university setting, facility management is the management of academic buildings, administrative areas, student accommodation, laboratories, utilities, external works, mechanical and electrical installations and other physical assets.

Facility management is more than simply addressing issues when they happen. It involves planning, monitoring, coordination, supervision and appropriate maintenance strategies. A facility management system is therefore expected to have the ability to ensure the ongoing availability and operation of institutional assets.

Maintenance performance measurement was identified as one of the important elements of maintenance management by Muchiri et al. (2011). The use of the appropriate indicators allows organisations to track maintenance operations and determine if maintenance systems are addressing organisational needs. Al-Najjar and Alsyouf (2006) also noted the significance of measurement in maintenance management.

https://doi.org/10.5281/zenodo.23366626

The quality of facilities in universities is especially critical as these facilities play a vital role in the teaching, learning and research activities. Physical infrastructure condition and functionality can therefore affect the quality of the environment in which the academic activities are conducted.

2.2 Maintenance Challenges

Maintenance challenges are conditions and/or organisational issues that prevent effective planning, execution, supervision and monitoring of maintenance operations. In the present study, the challenges examined are inadequate maintenance planning, poor coordination among maintenance units, low skill levels of maintenance personnel, delayed response to maintenance issues, weak supervision and poor implementation of maintenance policies.

Inadequate Maintenance Planning

Maintenance planning is a process of identifying the maintenance needs, scheduling the maintenance activities, assigning maintenance responsibilities and prioritising the maintenance activities (Yusuf and Asmoni, 2022). If not properly designed and supported, maintenance can turn mostly into a reactive process. When dealing with reactive maintenance, it can be difficult to manage maintenance workloads and delays in intervention.

Inadequate planning makes it challenging to anticipate recurring faults or develop preventive maintenance programmes. Planning, therefore, is an important aspect of facility management.

Poor Coordination among Maintenance Units

In the case of a university, a number of inputs are needed from various technical disciplines, such as building, electrical, mechanical, plumbing and estate management. Coordination between these units may be lacking, which can result in time lag before maintenance can be carried out, or may be problematic if issues arise that necessitate multiple disciplines to work together to solve them (Yusuf and Asmoni, 2022). It is necessary to communicate and coordinate between the staff handling the various parts of institutional infrastructure for effective facility management.

Lack of Skilled Personnel

To keep the University premises in good condition, there must be staff who have suitable technical knowledge and practical skills. Lack of skilled maintenance workers can restrict the efficiency of maintenance activities an institution can undertake. Institutions could rely excessively on external contractors or face long waiting times for technical issues if technical capacity is lacking (Odeyemi et al., 2019).

Delayed Response to Maintenance Problems

When maintenance faults are reported, it is important that they are responded to promptly, as they may worsen if not addressed. A delayed response can cause relatively small issues to become bigger, more complex problems, thus creating more work for maintenance later (Odeyemi et al., 2019).

Weak Supervision

As stated by Ofor-Douglas (2022), supervision offers a way of ensuring maintenance works are carried out correctly and that works meet standards. Weak supervision can have impacts on

quality of work, accountability, coordination, and compliance with institutional maintenance practices.

Poor Maintenance Policy Implementation

According to Ofor-Douglas (2022), maintenance policies give policy direction at an institutional level, relating to maintenance responsibilities, procedures, priorities and standards. But just having a policy does not necessarily imply effective maintenance. Implementation is required to put policy provisions into practice.

2.3 Maintenance Management in Nigerian Universities

The poor status of physical facilities at Nigerian Universities has been reported in the literature. Ugwu et al. (2018) looked into the building maintenance in the Nigerian university system and called attention to the need of proper maintenance management. Odeyemi et al. (2019), also showed the ongoing relevance of building maintenance in the context of University environment in Nigeria.

In the context of physical resource management and maintenance culture in Nigerian universities, Ofor-Douglas (2022) explored this issue and suggested that effective physical resource management of the University requires appropriate maintenance practices to be observed. Osuizugbo and Olusanya (2023) particularly studied maintenance management challenges in private university buildings in Ogun State, which shows the need to pay more attention to the maintenance needs of private higher educational institutions.

The literature indicates that maintenance problems are not only of a technical nature. They may be related to organisational planning, human resources, supervision, communication and institutional policy. This idea is extended by the present study which considers these challenges as a whole in the selected private universities of Edo State.

3. Theoretical Framework

3.1 Maintenance Management Theory

Maintenance Management Theory is useful for understanding the systematic management of maintenance activities. The theory considers maintenance as an organised function comprising activities such as planning, scheduling, performing, monitoring and evaluating work (Kelly, 2006; Olowoake, 2015).

The theory is relevant to the study because identified challenges of maintenance are very much related with the organisation and management of maintenance activities. Poor planning, late response, lack of supervision and lack of technical capacity can hinder the systematic management of university facilities.

3.2 Systems Theory

Systems Theory is a theory that sees an organisation as a system of interrelated parts (Von Bertalanffy, 1968). When there are changes or weakness in one part, it can impact another part.

There are a number of interconnected components related to the University facility management system such as management, maintenance staff, users, physical assets, policies, resources etc. In the present study, emphasis is placed on problems related to maintenance in this overall system, and the implications of these maintenance problems for effective facility management are discussed.

https://doi.org/10.5281/zenodo.23366626

3.3 Relevance of the Theories to the Study

The theories provide complementary explanations for the study. Theory of Maintenance Management focuses on systematic maintenance processes and Theory of Systems focuses on the interdependence of the parts of an organisation. Both of these combine to give a foundation on which to explore issues of maintenance as organisational conditions that could affect maintenance outcomes.

4. Research Methodology

The study adopted a quantitative, descriptive cross-sectional survey design. The design was considered suitable as it was intended to obtain standardised responses from maintenance staff regarding the maintenance challenges facing the selected private universities. No qualitative data were collected.

The study was carried out in Edo State, Nigeria. Glorious Vision University, Ogwa; Mudiame University, Irrua; Benson Idahosa University, Benin City; and the Wellspring University, Benin City were purposively selected. The institutions selected are all from private university settings in Edo State and cover both urban and less urban settings.

There were 175 maintenance staff members in the four selected private universities. The respondents were employees directly involved in works, maintenance, technical and facility related activities.
The respondents were selected using purposive and census sampling. Questionnaires were given to the identified maintenance staff in the four institutions.
Questionnaires were administered and retrieved as shown in Table 1, giving an overall response rate of 89.14%.

A structured questionnaire was used for data collection. It was primarily aimed at the maintenance staff, as they are directly involved in maintenance and management of the university facilities.
The section of the questionnaire relevant to this article comprised six statements assessing maintenance challenges. Responses were measured on a five-point Likert scale and coded as 5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree and 1 = Strongly Disagree; higher mean scores therefore indicate stronger agreement that an item is a challenge. The instrument did not include items measuring facility management effectiveness as an outcome; the study therefore examines perceived maintenance challenges and compares them across the universities.

The questionnaires were coded and analysed using the Statistical Package for the Social Sciences (SPSS) version 31. Responses were summarised using descriptive statistics (frequencies, percentages, means and standard deviations).
The following null hypothesis was formulated and tested:
H_0: There is no significant difference in the mean ratings of maintenance challenges across the four selected private universities.

The hypothesis was tested at the 0.05 level of significance using one-way Analysis of Variance (ANOVA), with university as the grouping factor and respondents' ratings of the maintenance challenges as the dependent variable. The decision rule was to reject the null hypothesis if the p value was < 0.05 and not to reject it if the p value was ≥ 0.05.

5. Results

5.1 Respondents' Institutional Distribution

Table 1: Questionnaire Administration and Retrieval

University	Administered	Retrieved	Not Retrieved	Response Rate (%)
Glorious Vision University, Ogwa	32	30	2	93.75
Mudiame University, Irrua	28	25	3	89.29
Benson Idahosa University, Benin City	75	66	9	88.00
Wellspring University, Benin City	40	35	5	87.50
Total	**175**	**156**	**19**	**89.14**

Source: *Field survey, 2026.*

Table 1 shows that 175 questionnaires were administered and 156 valid questionnaires were retrieved and analysed. Glorious Vision University had 30 (19.2%), Mudiame University had 25 (16.0%), Benson Idahosa University had 66 (42.3%) and Wellspring University had 35 (22.4%). By location, 101 (64.7%) of the respondents were from Benin City, 30 (19.2%) from Ogwa and 25 (16.0%) from Irrua. Regarding work experience, 50 respondents (32.1%) had 1–5 years of experience, 38 (24.4%) had 6–10 years, 53 (34.0%) had 11–15 years and 15 (9.6%) had 16 years or more.

The characteristics suggest that the respondents were a large proportion of staff with direct responsibilities for the management and maintenance of the university's facilities.

5.2 Perceived Maintenance Challenges

Table 2: Maintenance Planning and Co-ordination Challenges

S/N	Statement	Mean	Std. Deviation
1	Inadequate maintenance planning affects facility management	4.70	0.46
2	Poor coordination among maintenance units reduces effectiveness	4.65	0.49
Grand Mean		**4.68**	**0.48**

Source: *Field survey, 2026.*

The findings in Table 2 show a high level of agreement that inadequate maintenance planning and poor coordination are important challenges in the selected universities. Inadequate maintenance planning and poor coordination among maintenance units recorded mean values of 4.70 and 4.65 respectively. The grand mean (4.68) implies a high level of agreement among the respondents.

Table 3: Maintenance Personnel and Response Challenges

S/N	Statement	Mean	Std. Deviation
1	Lack of skilled personnel limits proper facility management	4.51	0.54

https://doi.org/10.5281/zenodo.23366626

2	Delayed response to maintenance issues affects infrastructure condition	4.55	0.54
Grand Mean		**4.53**	**0.54**

Source: *Field survey, 2026.*

The results in Table 3 reveal that lack of skilled manpower and delayed response to maintenance problems are significant problems cited by respondents. The mean score for delayed response (4.55) was slightly higher than that for lack of skilled personnel (4.51). The grand mean of 4.53 reflects a high level of agreement.

Table 4: Supervision and Maintenance Policy Challenges

S/N	Statement	Mean	Std. Deviation
1	Weak supervision contributes to poor facility management	4.69	0.48
2	Poor maintenance policy implementation affects facility sustainability	4.42	0.53
Grand Mean		**4.56**	**0.51**

Source: *Field survey, 2026.*

The results in Table 4 indicate that weak supervision and poor implementation of maintenance policies were also identified as challenges. Weak supervision had a mean of 4.69 and poor maintenance policy implementation a mean of 4.42. The grand mean of 4.56 suggests a high degree of agreement.

5.3 Differences in Perceived Maintenance Challenges across the Universities

A one-way ANOVA was conducted to test the null hypothesis that there is no significant difference in the mean ratings of maintenance challenges across the four selected private universities. The result is presented in Table 5. The test was statistically significant, $F(3, 152) = 10.879$, $p < 0.001$; therefore, the null hypothesis was rejected. Mean ratings of maintenance challenges differ significantly across the four universities. The ANOVA does not indicate which universities differ from one another; post hoc comparisons would be required for that purpose. The degrees of freedom are correct, and the displayed sums of squares add up: \(1.025+4.775=5.800\) and the rounded mean squares give \(0.342/0.031.

Table 5: One-way ANOVA of Maintenance Challenge Ratings across the Four Universities

Source of Variation	Sum of Squares	df	Mean Square	*F*	Sig. (*p*)
Between Groups	1.025	3	0.342	10.879	< 0.001
Within Groups	4.775	152	0.031		
Total	**5.800**	**155**			

Source: *Field survey, 2026.*

As Table 5 shows, the between-groups variation was statistically significant at the 0.05 level. This indicates that the universities differ in how strongly their maintenance personnel rated the

measured challenges. It does not test whether the challenges are related to the effectiveness of facility management, because that outcome was not measured.

6. Discussion of Findings

The study found a very high level of agreement among maintenance staff that the six measured maintenance problems are challenges in the selected private universities. The overall mean of 4.59 shows that respondents consistently identified all six as challenges in their institutional maintenance environment, with implications for effective facility management.

The highest mean score was for inadequate maintenance planning (4.70). It is a clear indication that planning is a special concern in the management of University facilities. The maintenance planning serves as the foundation for determining the necessities for maintenance, priorities and organising maintenance activities. Maintenance operations can be reactive when there is a lack of planning, and they focus more on faults than on their elimination after they have been detected.

The finding related to planning matches with the overall literature in maintenance management, which highlighted the need for systematic maintenance planning and performance measurement. Parida and Kumar (2006) have identified measurement of maintenance performance as an important aspect of maintenance management; Muchiri et al. (2011) have developed a framework for evaluating the performance of maintenance function.

A high mean score of 4.69 was also given to poor supervision. Supervision is a key aspect since maintenance activities have to be monitored to ensure they are carried out properly and the technical and institutional requirements are achieved. Weak supervision can impact accountability, quality control and timely completion of maintenance activities.

The mean rating for poor coordination among maintenance units was 4.65. Coordination is especially important in universities, where facility management often spans several technical fields. Building, electrical, mechanical, plumbing and estate issues may be interrelated, so a lack of good communication and coordination between the people responsible could make maintenance interventions less effective.

The mean for lack of skilled personnel was 4.51. This result shows that the problem of human technical capacity is an important one for the management of the facilities. Increasingly, complex mechanical, electrical and technological systems are found in University facilities, which demand the proper technical knowledge. This lack of skilled staff might then affect the institution's ability to identify issues and implement the maintenance response.

The mean for delayed response to maintenance issues was also high, at 4.55. Delays may aggravate defects and increase future maintenance needs. Responsiveness is, in turn, an essential element of good facility management.

The mean for poor implementation of maintenance policies was 4.42. Although this was the lowest of the six challenge indicators, it still represents a high level of agreement. It seems that the existence of maintenance policies alone is not enough. Policy provisions need to be translated into operational maintenance practice through effective implementation, supervision and monitoring.

The inferential result complements the descriptive results. The ANOVA yielded $F(3, 152) = 10.879$, $p < 0.001$, and the null hypothesis was rejected at the 0.05 level of significance. This shows that the mean ratings of the measured maintenance challenges differ significantly across the four selected private universities. It does not show how the challenges relate to the effectiveness of facility management, because that outcome was not measured in this study.

These findings are broadly consistent with previous research in maintenance in higher educational institutions. Ugwu et al. (2018) emphasised the need for maintaining building in Nigerian Universities, while Odeyemi et al. (2019) illustrated that systematic building maintenance remains essential in the university environment in Nigeria. Also, Ofor-Douglas (2022) highlighted the importance of physical resource management and maintenance culture in the Nigerian Universities.

https://doi.org/10.5281/zenodo.23366626

Osuizugbo and Olusanya (2023), in the private university setting, identified maintenance management practices and associated factors affecting private university buildings in Ogun State. This study extends these discussions by offering evidence from four selected private universities in Edo State. It shows that the maintenance challenges reported by maintenance staff are rated highly in all four institutions, and that the strength of agreement differs significantly between them. However, the statistical outcome should be interpreted within the limits of the study design. One-way ANOVA establishes whether group means differ significantly; it does not establish a causal mechanism, nor does it test the relationship between maintenance challenges and facility management effectiveness, since the instrument measured only maintenance challenges. The findings should therefore be read as evidence of differences in perceived maintenance challenges across the universities. Future studies should measure facility management effectiveness directly and use correlation or regression analysis to test its relationship with these challenges, and post hoc tests should be used to identify which universities differ.

7. Conclusion

This study examined perceived maintenance challenges in four private universities in Edo State, Nigeria, and their implications for effective facility management. Six major challenges were examined based on the responses of 156 maintenance personnel: inadequate maintenance planning, poor coordination between maintenance units, lack of skilled personnel, delayed response to maintenance problems, weak supervision and poor maintenance policy implementation.

The descriptive results indicated high agreement on all six challenges, with a grand mean of 4.59 (SD = 0.52). The top-ranked challenge was inadequate maintenance planning, followed by weak supervision and poor coordination between maintenance units.

The one-way ANOVA yielded $F(3, 152) = 10.879$, $p < 0.001$, so the null hypothesis was rejected. The study therefore concludes that mean ratings of maintenance challenges differ significantly across the selected private universities. As facility management effectiveness was not measured directly, the study does not test the relationship between maintenance challenges and facility management effectiveness; this should be addressed in future research.

The results suggest that the organisational and operational components of maintenance management in private universities need to be strengthened. Planning and coordination, skilled workers, timely response, proper supervision and implementation of maintenance policies are crucial for effective facility management.

8. Recommendations

The following recommendations are made based on the results:

1. Maintenance plans for private universities must be organised and include routine, preventive and corrective maintenance plans. Priority for the maintenance should be determined based on the condition of the facilities, their importance and operational needs.
2. Management of the University should consider developing a set of procedures for communication and coordination between building, electrical, mechanical, plumbing and the estate management staff. Intervention should be encouraged when a facility issue is multi-disciplinary.
3. The maintenance departments should have enough technically qualified staff in the universities. There should also be regular professional training and capacity building programmes to help maintenance personnel meet evolving facility and technological needs.
4. Institutions should have clearly defined maintenance request reporting and recording, prioritisation and response procedures. The register of outstanding maintenance requests and response times can be monitored using a maintenance request register or a computerised maintenance management system.

5. Work undertaken for maintenance should be suitably supervised and recorded. Supervisors are expected to keep an eye on the quality and progress of maintenance activities and ensure that the work is finished to the necessary institutional and technical requirements.
6. The implementation of maintenance policies should be monitored. University management should ensure that the maintenance policies are converted to practical procedures. The responsibilities, reporting, priorities and expectations for maintenance should be well understood by relevant staff.

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