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Assessment of the effectiveness of maintenance management systems in delivering quality maintenance services in higher institutions

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Abstract. The study assessed the effectiveness of maintenance and management systems in delivering quality maintenance services in higher institutions of learning with specific focus on the University of Lagos. There is the need for effectiveness in the management of educational buildings, facilities and supporting services. Self-structured questionnaires were administered to one hundred and ninety-one questionnaires (191) resident students of the University of Lagos, and three (3) to the maintenance executives of the Works and Physical Planning Department of the University of Lagos, with response rates of 71.73% and 100% respectively. Data collected were analysed using a combination of the Mean ranking and T-Test. Findings revealed a general dissatisfaction with the service quality delivered as the maintenance management system was not adjudged to be as effective as expected as various obstacles and factors influence the acceptable standard and quality of maintenance. The study recommended that the maintenance management team should improve on the effectiveness of their service delivery, by improving the rate of responsiveness of the maintenance staff through thorough training of skill and technical know-how.

KEYWORDS: Maintenance, Management systems, Service Delivery

1.0 Introduction

The successful running of educational institutions depends largely on the quality of the property assets of the institution. There is the need for quality maintenance management of property assets as this produces a significant contribution to the success of businesses; be it public, private or educational. Quality is a service management tool in the property maintenance management context, which is used to measure the performance of the property manager and maintenance staff [1]. According to [2], to be able to create a conducive learning environment that supports and stimulates knowledge, teaching,



innovation, and research in universities, the buildings would require up-to-date maintenance as they are a key factors of production used to produce future leaders, captains of industry, entrepreneurs, scientists, engineers and managers. Quality maintenance is highly needful for the enhancement of an environment that encourages intellectual, academic, and thus, economic growth and development. In the researcher's point of view, the primary objective of a quality maintenance is to achieve and enhance, as practicable as possible, the consistent and continuous quality performance of a property/building asset throughout its design life. The physical environment of a university needs to be properly managed as its productivity depends solely on its facilities and supporting services, thus, improving the performance of staff and students [3].

The demand for educational institutions in Nigeria has experienced relative increase, generally. The Federal and State Government, as well as private individuals and organizations are establishing and inaugurating new universities, despite the fact that the facilities and supporting services of the existing universities have being overly utilized and stretched to their limits. Although, erecting new educational structures helps in expanding and upgrading educational facilities and also enhance and improve the quality of education, but, however, maintaining existing structures and facilities to an acceptable performance standard is necessary to facilitate continuous transfer of knowledge and other academic activities.

The effectiveness of a service is based on the judgment of the direct users of that service on how well the service is being carried out [4]. Most universities adopt unplanned maintenance method with the absence of a formal maintenance policy, while neglecting the concerns of reputable professionals. It is observed that there is inadequate information and, thus, lack of understanding of the benefits of a properly managed maintenance service, with effective and efficient quality service delivery. A quality maintenance management should be simple, flexible, dynamic, and subject to periodic review as the need arises in order to accommodate technological changes and improvement and also simultaneously uphold the value system of the users. A fundamental way of assessing quality maintenance management service is to determine the level of satisfaction of the users. It is on this

foundation that this current research study will examine the quality of maintenance management services in the University of Lagos hostel buildings from the perspective of the users.

2.0 Maintenance Management System

The maintenance and management system engineers the procedures, process, policies and strategies that produce quality delivery of maintenance services. The level of effectiveness of this system determines the degree to which building maintenance is being prioritized, standardized and valued. In this section, the researcher aimed at reviewing the discovered strategies and policies being undertaken as stipulated in the following research studies.

In Malaysia, [5] carried out a research on maintenance management of buildings in the country. The purpose was to assess the maintenance management systems being adopted in Malaysia, with the aim of improving the value of property assets through a proactive maintenance management system that is based on the concept of value. Secondary data were collected from the country's newspapers, journals, textbooks, past projects and thesis, and were analysed with a critical review. The research revealed a high level of maintenance build-ups and poor value delivery to the end users thus the need to develop a prototype maintenance management model that would assist institutions to provide services that would satisfy the needs of the stakeholders.

In 2010, [6], identified, described and assessed the maintenance management system used by a university institution. Primary data was gathered through the analysis of a case study. Semi-structured interviews were conducted with the maintenance executives of the Property and Maintenance Management Department (PMMD). Based on the analysis of the case study, the data obtained revealed a number of shortcomings and irregularities in the building maintenance management system of the university. The study observed that quite a number of academic institutions still view building maintenance management as a challenge instead of a value adding strategy. The study concluded that although building maintenance practices in higher institutions are majorly corrective and cyclical, there is the absence of a holistic maintenance management agenda that would guide the processes of

decision-making. Thus, the need for a framework that would be able to guide maintenance organizations to ensure that every maintenance work that is initiated and executed, is consistent, systematic and holistic, was recommended by the authors

2.1 Quality of Maintenance Management Service

Maintenance Management involves the selection of the goals, planning, procurement, organization, co-ordination and control of the necessary resources for their achievement. It is concerned with the dynamics of circumstances and activities, and is generally motivated by the need to economize in the use of resources and time in achieving predetermined objectives". In 2009 ([7] developed the PROPERTYQUAL tool which serves as an instrument for measuring the quality of service provided by property managers. The aim of the research was to analyse the tenants' perceptions of the quality service provided by property managers in office buildings in Malaysia using a gap analysis model. The study identified various advantages service quality which includes the achievement and sustainability of a competitive advantage as determinant of business success or failure and also as an indicator of corporate performance. In property management, to desire to deliver quality service to clients is important in order to retain them. Using the Cronbach alpha and the Confirmatory factor analysis, the study confirmed that PROPERTYQUAL is a unique instrument which helps to measure the quality of service provided by the property management sector. Recommendations from the study revealed the need to educate the property management companies on effectiveness and efficiency in managing properties and also how to effectively deliver quality service and improve the satisfaction of tenants with property management services.

In the same vein, [1] adopted the SERVQUAL Model to assess the satisfaction of users with regard to the quality of the property management services provided by the Works & Services unit of Abubakar Tafawa Balewa University, Bauchi. 38 questionnaires were administered to the academic and non-academic staff whose offices are resident in the building. A response rate of 70% was achieved. Findings from the analysis showed a significant gap between the expectations of the

respondents' to the services provided and the actual service provided by the property management services in the university. The study posed the urgent need for the attention of the management of the university in order to attend to the non-satisfaction of the members of staff with their working environment as this is a major contributor to achievement of the university's goals.

[8] assessed the degree of students' satisfaction with academic facilities in six (6) private Universities in Ogun State. Eight hundred and sixteen (816) questionnaires, constructed with the use of a modified SERVPERF tool, were distributed. Data analysed, using the descriptive and inferential statistics, revealed that students in two out of the selected Universities were satisfied with the selected academic facilities (electricity supply, furniture, space per student, library, classrooms, IT/ICT laboratory), with indications of significant difference in students' satisfaction. The study recommended that management of the Universities should from time to time obtain feedback on the level of satisfaction that students derive from the facilities, and use such information to prioritize on facilities provision and maintenance. It also recommended that the National University Commission (NUC) should be mindful of students' basic needs with respect to library, IT/ICT laboratory and classroom facilities and build pertinent requirements into the Benchmark Minimum Academic Standards (BMAS).

3.0 DATA AND METHODOLOGY

Data for this study was gathered using survey research design whereby relevant questions were asked with the use of questionnaires to collect information from all the users of the hostel accommodation and facilities of the University of Lagos and the Maintenance Executives of the Works and Physical Planning Department of the University. The target population comprised of all resident students who are users of the hostel accommodations and facilities and the representatives of the Maintenance executives of the Works and Physical Planning Department of the University. Data collected were analysed with the use of the SERVQUAL model, combined with the T-Test and Mean analysis.

4.0 Results and Discussions

Table 1 Response Rate of Respondents

Study Group	Sample Population	Sample Size	No Questionnaires Distributed	of No Questionnaires Retrieved	of No Questionnaires Good Enough for Analysis	Percentage Retrieved
Resident Students	6,000	191	191	142	137	71.73%
Maintenance Executives	3	3	3	3	3	100%
Total	6,003	194	194	145	140	72.16%

Source: Field Survey, 2018

A total of one hundred and ninety-one (191) questionnaires were administered to the resident students of University of Lagos. The simple random sampling method was employed in the administration of the questionnaires. A total of one hundred and forty-two (142) questionnaires were retrieved. This represented a response rate of 73.958%. Out of those questionnaires retrieved, five (5) were not properly filled. The response rate of the respondents indicated an average result which was influenced by the challenge encountered by the researcher in easily accessing the respondents.

Table 2 Respondents' Profile (Resident Students)

Category	Respondent	Frequency	Percent (%)
Age	15 – 20	43	31.4
	21 – 30	88	64.2
	31 and above	6	4.4
Gender	Male	69	50.4
	Female	68	49.6
Family Profile	Humble	28	20.4
	Medium	95	69.3
	High Class	14	10.2
Taste	Low	2	1.5
	Medium	16	11.7
	Pius	68	49.6
	Gorgeous	51	37.2

Source: Field Survey, 2018

The students' response rates showing their gender indicated that sixty-nine (50.4%) of the respondents were male while sixty-eight (49.6%) of the respondents were female. This indicated a relatively equal distribution of respondents' perspectives, showing that the research is not biased, as

the perspectives of both genders were aired. Forty-three (31.4%) of the respondents were between the ages 15 to 20, eighty-eight (64.2%) were between the ages 21 to 30, while six (4.4%) were between the ages 31 and above. From the result on the age of the respondents, it can be deduced that majority of the respondents are between the age of 21 and 30, which is generally perceived to be the prime age for tertiary/higher education. Twenty-eight (20.4%) had a humble family profile; ninety-five (69.3%) had a medium class family profile; fourteen (10.2%) had a high class family profile. The taste of respondents differed as follows: two (1.5%) were low, sixteen (11.7%) were medium, sixty-eight (49.6%) were pious, while fifty-one (37.2%) were of gorgeous taste. From the result, it can be deduced that majority of the respondents relatively has pious and gorgeous taste. This implied that their expectations and perceptions on the standard and quality of living in the hostel, and the availability and use of the provided hostel and campus facilities would be high. Thus, the judgment of the respondents on the expectations and perceptions of the maintenance management services provided will be a function of the quality of their taste. The descriptive profiles of the Maintenance Executives are shown in Table 3.

Table 3 Respondents' Profile (Maintenance Executives)

Category	Respondent	Frequency	Percent (%)
Position Held	Director	1	33.3
	Deputy Director	1	33.3
	Manager	1	33.3
	Supervisor	0	0
Age Bracket	31 – 40	1	33.3
	41 – 50	1	33.3
	51 and above	1	33.3
Years of Professional Experience	5 – 10	0	0
	11 – 15	1	33.3
	16 and above	2	66.7
Academic Qualification	OND	0	0
	HND	0	0
	B.A/B.Sc.	1	25
	M.Sc.	1	25
	Ph.D	1	25
	Others	1	25

Source: Field Survey, 2018

From the result indicated in the Table 3, the three officials representing the Maintenance Executives of the Works and Physical Planning Department of the University were the Director, the Deputy Director and the Manager. The age bracket profile indicated and even age distribution among the three officials; the Manager was between the age ranges of 31 – 40, the Deputy Director was between the age ranges of 41 – 50, the Director was between the age range of 51 and above. The minimum years of experience ranged between 11 and 15 years (33.3%), while the maximum years of experience ranged between 16 years and above (66.7%). The Manager indicated a 11 – 15 range of years of experience, while the Deputy Director and the Director both have years of experience ranging from 16 years and above. This indicates a rich wealth of experience of these officials both in their age bracket and level of work experience. The result of the academic qualification of the officials indicated that the Director's highest academic qualification is Ph.D., the Deputy Director, M.Sc., while the Manager highest academic qualification is B.Sc. /B.A. with Project Management (MPM) Certification. Based on the wealth of the respondents' bio data, it is expected that their judgment and responses can be trusted.

Table 4 Availability and Effectiveness of the Maintenance Management System

Options	Expectations						Perception						P - E	T-Test	P Value
	1 Strongly Disagree	2 Disagree	3 Undecided	4 Agree	5 Undecided	Mean	1 Strongly Disagree	2 Disagree	3 Undecided	4 Agree	5 Undecided	Mean			
The campus is well-planned, attractive, landscaped and kept clean	1	2	6	38	90	4.56		1	3	112	20	4.09	-0.47	-7.732	.000
There is a system or mechanism to ensure traffic or safety in and outside the campus	1	4	7	46	79	4.45		4	20	103	9	3.84	-0.61	-9.205	.000
There is a system or mechanism to ensure the implementation of a waste management program	1	2	6	55	73	4.44		1	18	95	22	3.99	-0.45	-6.412	.000
There is a system or mechanism to ensure proper utilization, repair and upkeep of school facilities and equipment	2	3	4	46	82	4.48		7	11	100	18	3.93	-0.55	-7.225	.000
There is a system or mechanism to ensure the cleanliness and orderliness of the school campus	1	2	8	43	83	4.50		8	39	76	13	3.67	-0.83	-12.016	.000
The buildings and surroundings are properly maintained and periodically checked for pest control	2	3	10	35	87	4.47		43	42	41	9	3.09	-1.38	-13.303	.000

Source: Field Survey, 2018

When both sections (expectations and perceptions) were compared, it indicated a negative result for probable availability of each mechanism/system/operation. It was underscored that a

negative result must be viewed as an opportunity for improvement and not as a problem. The mean gap score (P – E) was obtained by subtracting the mean expectations from the mean perceptions of the statement measuring the availability and effectiveness of the system/mechanism in the maintenance management department of the University. The least service gap recorded is in the statement “ensuring the implementation of a waste management program” recording a mean gap of -0.45. The highest service gap recorded is in the statement “proper maintenance and periodic check for pest control” recording a mean gap of -1.83. In summary, all mean gap recorded scores ranged from -0.45 to - 0.83, which are indicative of the fact that users’ expectation from the available system/mechanism in the case study relatively exceeds the actual perceived service provided by the existing mechanism of service delivery by the maintenance management department of the University. As shown in Table, the mean gaps between the users’ expectations and perceptions were all significant at a 0.05 level of significance, thus, indicating that there was a gap in the quality of service provided by the maintenance management unit of the University.

5.0 Summary

The analysis revealed that even though there is the availability of the maintenance department which is also in charge of periodic check for pest control on campus, there is a need for earnest and immediate improvement, as the ineffectiveness of this system can affect the quality of health of the resident students and quality of hygiene of the campus surrounding which is meant to be a conducive environment for learning and research. There’s also the need for the maintenance department to improve in their quality of service delivery as lack of effective maintenance would mean high rate of dilapidated hostels and facilities, and thus degraded condition of hostel accommodation.

References

- [1] Is'haq, M.M., Musa, S.I., and Bello T.H. (2013). Quality of Property Management Services in Public Educational Buildings in Nigeria. *Mediterranean Journal of Social Sciences*, IV(2).
- [2] Idrus, A., Khamidi, M.F., and Lateef, O.A. (2009). Value-Based Maintenance Management Model for University Buildings in Malaysia - A Critical Review. *Journal of Sustainable Development*, II(3), 127-133.

- [3] Adewunmi, Y., Famuyiwa, F., and Harrison, E. (2009). Post-Occupancy Evaluation of Facilities in Nigerian Private Universities: a case study. *A (Ed) Procs 25th Annual ARCOM Conference, Association of Researchers in Construction Management*, (pp. 505-514).
- [4] Onuoha, U.D., Omokoje, A., and Bamidele I.A. (2013). Assessing Service Effectiveness and Satisfaction with Library Services at Babcock University, Nigeria. *Information and Knowledge Management*, III(9).
- [5] Lateef, O.A. (2009). Building Maintenance Management in Malaysia. *Journal of Building Appraisal*, IV(3), 207-214.
- [6] Lateef, O.A., Khamidi, M.F., and Idrus, A. (2010). Building Maintenance and Management in a Malaysian University Campuses: a case study. *Australasian Journal of Construction Economics and Building*, X(1 & 2), 76-89.
- [7] Baharum, Z.A., Nawawi, A.H., and Saat, Z.M. (2009). Assessment of Property Management Service Quality of Purpose Built Office Buildings. *International Business Research*, II(1).
- [8] Oluwunmi A. (2014). (2014). Students' Satisfaction with Academic Facilities in Private Universities in Ogun State, Nigeria. *Department of Estate Management, Covenant University, Ogun State, Nigeria*.