# Assessment of Operation and Maintenance Practices in Facilities Management of Office Buildings in Lagos, Nigeria

**Tosin B. Fateye[1*], Toluwalase G. Oluwole[2], Abayomi S. Ibisola[3] , Samson E. Agbato[4]**

[1]Department of Estate Management, Redeemer's University, Ede, Osun State, Nigeria
[2]Department of Estate Management and Valuation, The Federal Polytechnic, Ilaro, Ogun State, Nigeria
[3, 4] Department of Estate Management and Valuation, Moshood Abiola Polytechnic, Abeokuta, Ogun State, Nigeria

*Email: *fateyetosin@gmail.com*

## Abstract

The development of facility management (FM) in Nigeria is relatively new and limited in scope although it has been introduced for more than four decades. This study attempts to assess the operation and maintenance practices in the FM of office buildings from the Nigeria context, aimed to address issues concerning activities of operation and maintenance. It also intends to reveal the adoption of FM techniques and associated challenges in the office buildings in Lagos., Nigeria. A total of 216 members of the Nigerian Institution of Estate Surveyors and Valuers (NIESV) were sampled using purposive sampling techniques and their responses were analysed by descriptive statistics such as weighted mean score (WMS), severity index (S.I), and Kruskal-Wallis H test (KWT). The study found that the major FM activities that are mostly engaged include space management, power plant/electricity maintenance, waste management, lift maintenance, general cleaning services, routine maintenance, and water management. While the preferred FM technique is a blended approach (both the preventive and the corrective methods). The prominent challenges in their respective categories were design flaws and poor installation of equipment (technical); inconsistency in financing maintenance, and high cost of maintenance components (finance); weak standards and poor enforcement (administrative), indifferent attitude towards maintenance issues, wrong perception and lack of foresight (top management). The study concluded that the operations of the FM practice are still in their infancy stage and characterised by prominent challenges of technical, administrative, and finance. However, being a multi-disciplinary profession, the study suggests efficient collaborative effort can be strengthened by an institutional framework that encourages human capacity development and enhanced technology to foster sustainable facilities management practice in the country.

Keywords: Facility, Management, Operation, Maintenance, Office Building

## 1.0 INTRODUCTION

Facilities management (FM) is the integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities (Thomson, 2010). The British Institute of Facilities Management (BIFM) has defined FM to include co-coordinating all efforts related to planning, designing & managing buildings and their systems, equipment & furniture to enhance the organisation's ability to compete successfully in a rapidly changing world (BIFM, 2010). Burt (2012) claimed that, in the past, the general perceptions of facilities management are limited to janitorial services, which stemmed from services provided by janitors and caretakers during the 1970s. However, Achoru (2015) noted that facilities management become a recognised and essential process within organisations globally in the last two decades, with the scope broadening, and encompassing coordinating the integration among human resources, process, technology, and workplace

to achieve the organisation's strategic goals and objectives. FM as a profession as well as a practice has witnessed rapid growth in recent decades. For instance, in the United States, the U.S. Bureau of Labour Statistics reported that as of 2020, the number of jobs in the FM industry was 332,000, and by projection, the FM jobs are expected to grow by 9 percent on average, with an addition of 28,600 jobs in the field by the year 2030 (USBLS, 2022).

FM practice offers an integrated approach to ensuring that the life of buildings is preserved and prolonged in an economical manner that minimises disruptions to normal activities. The practice involves the integration of the planning and management of a wide range of services both 'hard' (e.g. building fabric) and 'soft' (e.g. catering, cleaning, security, mailroom, and health & safety) to achieve better quality and economies of scale (BIFM, 2010). The author further expressed that, the management practices of FM have extended to a broad range of tangible assets, support services as well as people skills. Therefore, FM practice is one of the fastest growing sectors, both in developed and developing countries like Nigeria, readily acknowledged in many companies, especially the middle rise buildings such as office property type. The office building is usually purpose-built, and used, generally, for delivering administrative, consultancy and service-related activities.

In typical office buildings, facilities management is one of several services that support the core functions of the organisation. The management practice of facilities in office buildings involves guiding and managing the operations and maintenance of buildings and infrastructure on behalf of property owners. However, Outubro (2011) expressed that, despite its growing acceptance and use in advanced countries, its application, especially in developing countries such as Nigeria, appears yet limited and inadequately explored. The author added that the poor FM practice has led to operational problems which affect users' satisfaction and building life for the office buildings. For instance, improper allocation of funds for the maintenance of office buildings has rendered many techniques applied by managers useless. In addition, other challenges are characterised by weak maintenance policies and implementation, inadequate training, level of technology, inadequate spare parts and non-qualified personnel among the managers that had led to the inadequacy of FM practice in the country. Hence the need to explore real-time situations of FM practice in the Lagos property market with a focus on office buildings has become pertinent with the aim of revealing the peculiarities of the market and improving FM practice in the study area.

## 2.0 LITERATURE REVIEW

### 2.1 Concept of Facility Management (FM)

The concept of FM is still evolving, and relatively new especially in developing countries including Nigeria (Goyal and Pitt, 2007). Before the emergence of FM, property management is a popular practice that involves the application of knowledge to care for the building and its components. Oladokun (2011) posited that the conscious attitude developed by the business and organization over the year on the need to provide services to support business operations such as building, workplace, and work-life conditions at an optimal cost of operation while focusing on the core business activities led to the development of FM practice. Moore and Finch (2004) added that the FM entails the development, coordination, and management of all the non-core specialist services of an organization such as building and their systems, plant, IT equipment, and fittings, together towards achieving the strategic goal of the organization.

According to IFMA (2003b), the person coordinating the management of the non-core services is referred to as a facility manager and the scope of their function extends to facility planning; forecasting, and budgeting; procurement; leasing & disposal of real estate, furnishings equipment and outside facility services. Others include facility construction; renovation and relocation; health safety and security; environmental issues; development of corporate facility policies and procedures; quality management including benchmarking and best practices; architecture and engineering planning and design; space planning and management; building operations; maintenance and engineering; supervision of business

services such as reprographics; transportation and catering; telecommunication; and code compliance. Chotipanich (2004) posited that the wide range of services provided by a facility manager is broad, highly inclusive and multi-disciplinary nature which has made it difficult to practitioners to identify the boundary in FM activities. However, the duties in FM as classified by the British Institute of FM (BIFM) are presented in Figure 1.

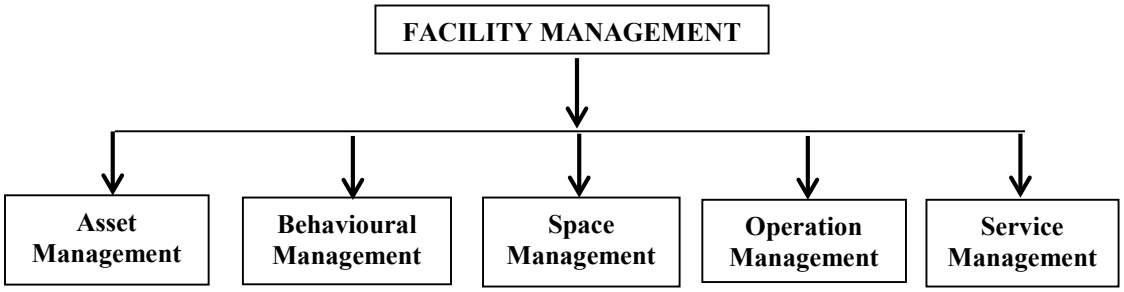


Figure 1: Facility Management Network
Source: British Institute of Facility Management (BIFM, 2009)

## 2.2 An Overview of Facility Management (FM) Practice.

Facilities management (FM) practice has been the subject of academic research since the early twentieth century, primarily focusing on its functions, techniques and attendance challenges to building performance and the overall goal of an organisation. However, researchers in the developed and developing countries have worked on the facility management practice, though their findings tend to be similar but at varying levels of prominence, magnitude & statistical significance across different zones, districts, and countries at large (Garg, and Deshmukh, 2011). For instance, Nielsen, Jesen and Jensen (2009) examine the extent to which sustainable management practice is integrated into the operations of housing estates in Denmark. The study revealed that social housing facilities in Demark enjoyed good maintenance management practices which have led to a reduction in energy, water and waste generation but at varying levels across the social housing estates.

In Britain, Amaratunga, Baldry and Sarshar (2000) attempt to know how facilities management practice could promote organisational performance and provide a competitive advantage in higher education properties using a balanced scorecard approach. The study found that organisations perform better when appropriate sustainable facility management practice is deployed. Similarly in Australia, Brackertz and Kenley (2002) used a service-balanced scorecard approach to measure the facility's performance such as community, services, building and financial perspectives of buildings in the Melbourne local government area. The study concluded that the committed effort of the government at all levels is linked to consistent improvement of facilities management practices in public building.

## 2.3 Facility Management (FM) Practice in Nigeria

In Nigeria, the FM practice is new and limited. The practice of FM was not known in the country until 1993 (Ojo, 2002; Oladokun, 2011; Aliyu et al., 2015). The increasing popularity of FM practice cannot be disconnected from the incorporation of International Facilities Management Association (IFMA) which started full operation in the country in 1997. Since the establishment of IFMA, the members of the association has grown substantially over the year, with the professional members cut across a wide range of discipline in the built environment profession such as engineering, architecture, estate surveying and valuation, building technology, quantity surveying among others. For instance, Aliyu et al. (2015) examined the application of facilities management practice in commercial property using Jos, Nigeria as a case study. The study found that the application of facility management is limited, and described it as below average. Similarly, Oladokun (2011) used Lagos property market to assess the profession that dominates FM practice in Nigeria. The study sampled facility managers and discovered that the FM practice is dominated by young professionals in the built industry. The author concluded that FM practice is at the infant stage in Nigeria and needs effective nurturing to develop.

Meanwhile, Koleoso, Omirin and Adewunmi (2015) compared the specific role of the facility manager to building support service (BSS) practice in Lagos State, Nigeria. The primary objective of the study was to examine the work of the BSS practice and examine whether they incorporated the principles and strategy of FM practice in the provision of their services. The study sampled the BSS providers and found that they do not adopt PM practices; they only use FM as a catchphrase to encourage patronage. The authors also reported that the BSS providers demonstrated insufficient knowledge of FM's role and that they are still largely confused about its distinctive features and value adding benefit. The study recommended the provision of training institutions to enhance capacity development in FM practice in the country. In Enugu, Nigeria, Chinedu and Oladejo (2019) the challenges confronting the FM practice with a focus on manufacturing industries were analysed. The study ascertained the strong impact of FM practice on manufacturing industries with its associated challenges. The authors highlighted prominent challenges such as poor funding, bureaucracy, environmental factors and skill gap among others, and suggested a way forward by encouraging seminars and training on FM maintenance programmes. In addition, Nedolisa and Egolum (2019) examined the FM practice in the hospitality industry in Anambra State and discovered that FM practice is less effective in the hospitality industry.

## 2.4 Classification of Facility Management (FM) Activities

Meanwhile, the management practice of FM covers a wide range of activities. According to Atkin and Brooks (2009), the activities include contract management, procurement management, maintenance of the grounds and buildings, general cleaning of the facility, catering and vending, health and safety, security, utilities, and communications infrastructure and space management. Other responsibilities required of a professional facility manager comprise effective and efficient project budgets, planning, purchasing, delivery and internal coordination. The author pointed out that, a good facility manager must be able to work well with the people and efficiently utilise, allocate and coordinate space management among the occupants, to achieve optimal building performance. From another perspective, Ho, Chan, Wong and Chan (2000) categorised FM services into two, namely hard and soft services. It was shown that the soft services require limited or no expertise as they are routine activities such as housekeeping, pest control, garden and lawn, waste management, mail room service, vendor management, staffing solutions, security services hospitality services, health and safety, etc. On the other hand, the hard service requires a certain level of knowledge and technical expertise such as electro-mechanical services, engineering services, energy and safety, plumbing services, lift and power plants maintenance, space, water, and waste management, etc. However, Olagunju (2016) emphasised the need to deploy proactive FM techniques to prevent unwanted FM management outcomes.

Previous works have classified techniques adopted in the maintenance of building facilities into two major areas namely the preventive and the corrective approaches (Lee and Scott, 2017). Preventive maintenance includes all facilities management practices that are embarked upon as part of scheduled maintenance activities executed before a facility starts to malfunction or breaks down or ceases to provide its intended function. The corrective approaches involve the maintenance practices embarked upon after an office building infrastructure or any of its components breaks down or ceases to provide its intended function. Similarly, Jensen (2008) categorised facility management of building-related functions into three major levels which are operational, tactical, and strategic (see Fig. 1). Adenuga and Iyagba (2005) studied a strategic approach to the maintenance of the public building in Lagos. It was concluded that a good facilities management practice emphasises and utilises preventive facilities management approach to all strata of FM functions, especially at the strategic level of building-related services to reduce the incidence of breakdowns or malfunctions in a building and hence reduce the need for corrective facilities management.

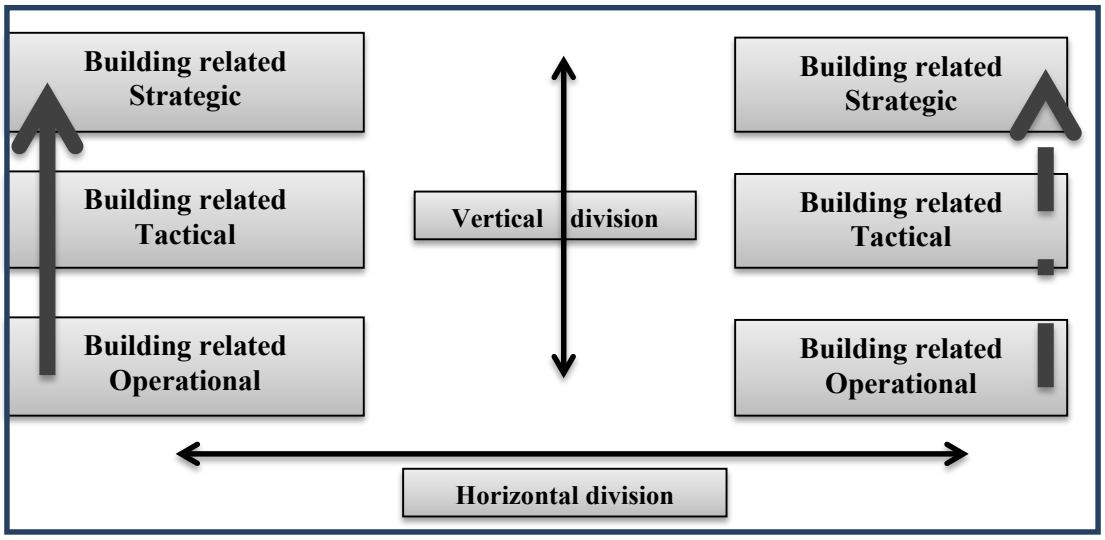


Figure 2: Facility Management Functions.
Source: Jensen (2008)

Meanwhile, Rahman, Akasah, Abdullah, and Musa (2017) reported that good maintenance of facilities is not practiced in the less developed countries including Nigeria, for reasons attributable to some significant issues and problems. The authors further classified the challenges into three broad categories such as top management problems, human resources problems, and technical problems. Adewale (2015) maintained that the insufficient management personnel that has the expertise and understanding of the operations of FM remain a big threat to providing effective and efficient FM services. Alshehri, Motawa and Ogunlana, (2015) added that personnel background including educational and professional qualification, level of exposure and years of experience, facility procurement management strategies, government regulations, and rules are critical as they play important roles in the management practices of FM as it will influence the management system of a building.

Similarly, Fadahunsi et al. (2018) examined the benefits associated with the use of adopting facility management practices in the Nigeria private university. The authors used Covenant University as a case study and found that the proactive maintenance approach has improved the health and safety of the people, the workplace, and the functionality of the school buildings. It was recommended that facilities tools such as asset tracking and register, estate operational plan, cost-benefit analysis, and energy auditing, and control and performance analysis could enhance the facilities management practice, particularly in the tertiary institution. In hospital facility management practice, Chukwu, Okolier and Ezekoli (2021) observed a fairly operational system and inefficient transportation system, suggesting provision for transportation facilities with a high level of training and human capacity development.

## 2.5 Facility Management (FM) Techniques

In facility management literature, Brooks (2005); Thomson (2010) and Olagunju (2016) discussed the strategies, approaches, methods, and techniques that have focused on two (2) major but broad categories, namely, the preventive (proactive) and corrective (reactive) approaches to FM practice. Thomson (2010) posited that the facility management technique that will be adopted depends on the type of office facilities and the functional areas of facility management required, factors that influence the facility management requirements, and the sustainability factors & their requirements. Olagunju (2016) argued that the conflicting interest over the maintenance strategies, standards, and resources between top management at the strategic level and maintenance personnel at the operational level, and core businesses and operational sub-businesses has substantially contributed to the failing approaches to FM practices.

Other studies by Moghaddam and Usher (2010), Au-Yong, Ali and Ahmad (2013), and Au-Yong, Ali and Chua (2018) have stressed the importance of adopting preventive techniques for FM, especially in high-rise properties. The authors explained that preventive techniques of maintenance activities include

monitoring and inspection, cleaning, lubrication, adjustment, alignment, minor repair, and part replacement, undertaken to avert the occurrence of system failure. Batun and Azizoglu, (2009) and Fouladgar et al. (2012) added that preventive maintenance is more efficient and cost-effective. However, Au-Yong, Ali and Ahmad (2013) linked the challenges faced by the preventive approaches concerning routine maintenance due to high costs and shortage of funds. The study concluded that the low maintenance outcome in an office property is caused by poor preventive maintenance measures and reduces occupants' satisfaction.

For the corrective technique, Olanrewaju et al., (2011) explained that corrective maintenance is a conditionally driven maintenance measure, perform when a failure occurred. It is observed that replacement becomes necessary, and more effective when the funds are available. Hsieh (2009) and Nik-Mat et al. (2011) expressed that despite the development of proactive (preventive measures) and their benefits, a corrective technique remains a dominant maintenance measure for managing facilities and services in the property. For instance, Hsieh (2009) examined the management of condominium property types in Taiwan. It was found that 52 percent of the management committees carried out the maintenance of facilities on a corrective basis. The identified issues associated with the approach include imperfect bylaws and regulations, unplanned operations, insufficient funds, poor documentation, and weak management commitment and political will toward FM management practice of condominium property type. Nik-Mat, Kamaruzzaman and Pitt (2011) emphasised the risk of building system failure emanating from weak monitoring and poor corrective maintenance culture.

Meanwhile, the term 'blended or blending' is a new growing concept employed by much academic research in different fields to indicate the 'more than one or 'combinations of approaches, methods, ideas, or strategies. For instance, in the engineering field, Brien, Foster, Tucker and Hegde (2021) used the term 'blended approach' to study the integration of qualitative human factors and quantitative operations research modelling aimed to understand how University adapts to the challenges of the COVID-19 pandemic. Similarly, Organisation for Economic Cooperation and Development (OECD) in their 2018 economic survey report, term the report 'blended finance funds and facilities' geared towards consolidating blending development cooperation in finance principles and unlocking commercial finance for sustainable development goals (SDG). The study, therefore, adopted the terminology 'blended' approach to mean the use of the combined preventive and corrective technique in the FM management practice to reflect the peculiarity characterised by the study area.

Another area of concern in the literature concerning challenges of facilities management practices are financial problems and issues with budget allocation for the maintenance of building facilities (Horner, El-Haram, and Munns, 2014; Ali and Chua, 2016). Rahman et al. (2017) noted that inadequate specialists, lack of clarity on job/department structure, non-strict monitoring/supervision, technical problems, inadequate spare part/software tools, and low awareness of the need to deploy strategic management practice to building facilities are some of the prominent challenges characterised with developing countries. Adali and Peter (2015) work on facilities management towards best practices and highlighted that FM practices especially in developing countries such as Nigeria are plagued with weak and standard enforcement, poor quality of building materials, and economic instability.

In addition, Lee and Scott (2017) observed that most of the personnel at the top management level do not understand the management and operational situations. Alshehri et al., (2015) and Rahman et al. (2017) attributed the top management challenges relate to a lack of knowledge of maintenance scope and procurement, unqualified maintenance contractors, financial issues, and government rules and regulations. Past studies have highlighted several challenges which include the work by Ali and Chua (2016) on human resource problems such as lack of supervision and unclear job description. In addition, Baek (2017) identified technical problems characterised by inadequate tools, spare parts, technical know-how, and a low level of technology development. On the hand, Olagunju (2016) highlighted that the challenges associated with the maintenance of facilities and services in the building vary and largely depend on change and nature of behaviour/attitude of the occupier/owner of the building, economic value/benefits, and cost of implementation of facilities management.

Despite a large body of literature on facility management practices across the globe, there is no unified result, as their findings vary from different buildings and facilities across countries. The variations in the findings are attributable to the uniqueness of each property and facility in specific and the property market in general, as there are no two identical property market situations. Also, the levels of technology advancement, property market transparency and maturity, human capacity development, and ICT usage further strengthened the differences in FM practices across the globe to reflect the peculiarities in the social, economic, and political development of countries. Therefore, with a focus on the Lagos office property market, the study attempts to assess the facility management practice in the study area, aimed at providing information that could enhance the facility management practice in the Lagos property market and the country at large

## 3.0 RESEARCH METHODS

The primary data and the analysis in this study are non-probabilistic in nature. The members of the Nigerian Institution of Estate Surveyors and Valuers (NIESV) practicing in Lagos state constitute the study population. A purposive sampling technique was employed to identify ESVs that had engaged and/or still providing management service on facilities in an office property type, particularly office building. In addition, referring sampling method was used to complement the formal approach to be able to reach the target population and increase the study sample size. A total of 216 ESVs were identified and sampled. A structured self-administered closed-end questionnaire was used to obtain data with the aid of two (2) trained research assistants. In addition, the researchers engaged in discussion with a few ESV members that made themselves available on the subject matter of the study. The data were analysed using descriptive statistics such as frequency distribution, weighted mean score (WMS), and severity index (SI). The weighted mean score and severity index are mathematically illustrated Eq 1.

$$\text{WMS} = \frac{\text{TWV}}{\sum_{i=1}^{5} Pi} \quad \text{----------Eq. 1}$$

Where TWV is the total weighted value attributed for each observation. It is expressed as the summation of the product of the number (*Pi*) of respective weight value assigned to each observation (*Vi*) with *i* ranging from *1*-least scale to *5*-highest scale (5-point Likert scale) as expressed in Eq. 2

$$\text{TWV} = \sum_{i=1}^{5} Pi\,Vi \quad \text{----------Eq. 2}$$

However, the study adopted a clear-cut boundary adjustment format to measure measurement the opinions of the respondents on a 5-point Likert scale *(i=1, 2, 3, 4 & 5)* with respectively assigned weights such as 1-*Never (N),2- Seldom (S), 3-Sometimes (ST), 4-Most times (MT), 5-Always (A)* The adjusted boundary is given in the format of *x:WMS:y* where *x* is the *lower boundary limit* and *y* is the *upper boundary limit*. Therefore, the measurement of the categories of measurement scales for the respondents' opinions on FM management practices activities and the rate of FM technique adoption is expressed in Eq.3:

| | |
|---|---|
| *Always:* | 4.50<MWS≤5.00 |
| *Most times* | 3.50<MWS<4.50 |
| *Sometimes* | 2.50<MWS<3.50 |
| *Seldom* | 1.50<MWS<2.50 |
| *Never* | 0.00<MWS<1.50 |

The S.I is derived from WMS and the formula is given as

$$\text{S.I (\%)} = \frac{\text{TWV}}{\sum_{i=1}^{5} Pi * 5} \times 100 \quad \text{----------Eq.3}$$

However, Eq. 1 & 2 were deployed to assessed issued concerning the activities engage and the rate of adopting techniques. Eq. 3 measures the severity of the challenges characterised by the FM operation and maintenance of office buildings in the study area.

## 4.0 RESULTS AND DISCUSSION

Table 1 shows the summary of the background information of the respondents on their gender, age, highest academic qualification, professional cadre, and year of relevant work experience. The result shows that the male gender dominates the management practice with a percentage score of 68.71, higher than their female professionals 31.29%. The outcome of the gender analysis agrees with the general perception of the real estate profession as a male-gender dominating industry. The age distribution of the respondents shows that 43.67, 31.32 and 17.33% were within the age bracket 31-40, 41-50 and 21-30 years respectively. The least represented age group was above 50 years and account for 7.68% while respondents' age below 21years was not represented. On average, approximately 83.67% of the respondents were of 31 years representing the age group of the country's labour force. However, the result implies the respondents represent the age segment of mature persons that are capable of giving informed opinions on the subject matter of the study.

The result of the analysis of the highest academic qualifications shows that 44.91% and 43.06% had obtained Higher National Diploma (HND) and Bachelor of Science/Technology (B.Sc./B.Tech) certificates respectively, and 11.57% had Master of Science/Technology (M.Sc./M.Tech) while respondent with Doctor of Philosophy (Ph.D) accounts for 0.46%. The result indicates that the respondents have a minimum academic requirement and pre-requisites knowledge to practice the profession, which could influence their informed opinions. Meanwhile, for the professional status, 40.28% of the respondents have become associate members of the institution, and 32.87% had registered and obtained a license to practice as a registered estate surveyor (RSV) while 6.58% had attained the apex level (fellowship) of the profession. The pupil surveyors (graduate/probationers) account for 20.37% of the total sample. Also, the result of the relevant years of experience in the field of practicing the profession reveals while half of the respondents (57.41%) had relevant experience of between 6-10 years, approximately 90% had a minimum experience of 6 years and above in practice.

It was asserted by Alshehri et al., (2015) that personnel background including educational and professional qualification, level of exposure, and years of experience have a strong influence on the management practice of facilities a building system, which is reflected by the profiles of the respondents in this study.

Table 1: Profile of the Respondents

| Profile | Parameters | Frequency | Percentage (%) |
|---|---|---|---|
| Sex | Male | 148 | 68.71 |
| | Female | 68 | 31.29 |
| | *Total* | *216* | *100.00* |
| Age | < 21yrs | - | - |
| | 21-30yrs | 37 | 17.33 |
| | 31-40yrs | 94 | 43.67 |
| | 41-50yrs | 68 | 31.32 |
| | >50yrs | 17 | 7.68 |
| | *Total* | *216* | *100.00* |
| Academic Qualification | HND. | 97 | 44.91 |
| | B.Sc/B.Tech | 93 | 43.06 |
| | M.Sc/M.Tech. | 25 | 11.57 |
| | Ph.D | 1 | 0.46 |
| | *Total* | *216* | *100.00* |
| | Graduate/Probationer | 44 | 20.37 |
| | Associate | 87 | 40.28 |

| | | | |
|---|---|---|---|
| Professional Cadre | RSV | 71 | 32.87 |
| | Fellow | 14 | 6.48 |
| | *Total* | *216* | *100.00* |
| Work Experience | <1yr | - | - |
| | 1-5yrs | 21 | 9.72 |
| | 6-10yrs | 124 | 57.41 |
| | >10yrs | 71 | 32.87 |
| | *Total* | *216* | *100.00* |

The study attempted to determine the prominent activities and the opinions of the respondents when managing the facilities in the office buildings which are measured on a 5-Likert scale. The result of the analysis showed that the level of practicing the activities in the management of office buildings varies as indicated by their WMS statistics. The study discovered that activities (WMS) such as *space management* (4.23), *power plant/electricity maintenance* (4.13), *waste management* (4.12), *lift maintenance* (3.97), *general cleaning services* (3.87), *routine maintenance* (3.85) and *water management* (3.78) relatively higher, *most often* (3.50<MWS<4.50) engaged with in the FM practice of office property. The respondents indicated that they *sometimes* (2.50<MWS<3.50) engage in some activities such as health and safety management (3.13), emergency and breakdown maintenance (2.79), and procurement management (2.69). Meanwhile, management activities such as *green landscaping of building*s (2.44), *energy audit* (2.38), and *demolition of dilapidated structures* (1.72) were indicated to be *seldom* (1.50<MWS<2.50) engaged in the FM practice for office buildings.

The outcomes of the analysis as shown in Table 2 can be attributed to many reasons. Except for general cleaning, the category of top-rated activities (most times) general cleaning is described as 'hard' services (Ho, Chan, Wong and Chan, 2000) and very critical to the consistent performance of office buildings. For instance, the need for appropriate approaches to space management is essential to sustainable people-workplace management. Space management such as optimal useable space, service charge apportionment, strategic rent collection approaches, etc. could enhance the peaceful coexistence among the users in office buildings. In addition, regular maintenance of lift and power generating plants is equally unavoidable to ensure the effective and efficient function of the workplace. The need to ensure regular and general cleaning services and waste management is further strengthened by the state laws and regulations on environmental protection and management. However, the least management activities carried out by the respondents are in the areas of building landscaping and demolition of the old structure. This is expected as these facility management activities are often outsourced or carried out by independent contractors.

Table 2: Activities of FM Operation and Maintenance Practice in Office Building

| **Activities** | **Level of Practicing** | | | | | **TWV** | **WMS** | **Avg. WMS** | **Rating** |
|---|---|---|---|---|---|---|---|---|---|
| | **N** | **S** | **ST** | **MT** | **A** | | | | |
| Space management | - | 14 | 66 | 404 | 405 | 914 | 4.23 | 3.99 | *Most times* |
| Power Plant (electricity) maintenance | - | 12 | 66 | 508 | 305 | 891 | 4.13 | | |
| Waste management | 4 | 24 | 93 | 268 | 510 | 887 | 4.12 | | |
| Lift Maintenance | - | 6 | 207 | 304 | 340 | 857 | 3.97 | | |
| General cleaning services | - | 6 | 141 | 564 | 125 | 836 | 3.87 | | |
| Routine Maintenance | 3 | 14 | 201 | 324 | 290 | 832 | 3.85 | | |
| Water Management | 2 | 46 | 123 | 416 | 230 | 817 | 3.78 | | |
| Health and safety management | 22 | 78 | 198 | 268 | 110 | 679 | 3.13 | 2.80 | *Some-times* |
| Emergency and Breakdown Maintenance | 22 | 122 | 261 | 148 | 50 | 603 | 2.79 | | |
| Procurement management | 24 | 158 | 174 | 196 | 30 | 582 | 2.69 | | |
| Green Landscaping of buildings | 37 | 166 | 204 | 76 | 45 | 528 | 2.44 | 2.51 | *Seldom* |
| Energy Audit | 27 | 130 | 146 | 208 | 5 | 516 | 2.38 | | |
| Demolition of dilapidated structures | 67 | 182 | 111 | 12 | - | 372 | 1.72 | | |

*Note: Never (N), Seldom (S), Sometimes (ST), Most times (MT), Always (A), Total Weighted Value (TWV), Weighted Mean Score (WMS)*

Table 3 presents the forms of FM operation and maintenance practice techniques that could be adopted and the extent of usage by the respondents. The level of adoption is measured on a 5-point Likert

scale ranging from the least level of adoption (*Never*-1) to the highest (*Always*-5). The result of the analysis showed that techniques such as the blended approach (the combination of preventive and corrective FM techniques) with WMS 3.74 were the most adopted techniques in the FM operation and maintenance practice. Furthermore, the study noted the relatively higher use of preventive measures to corrective techniques as indicated by their respective WMS (i.e. 3.42 and 3.28). The result reflects some level of improvement in the operation and maintenance practice of facilities of an office building in the study area. The higher preference for preventive techniques relative to the corrective approach corroborates with the findings of Olagunju (2016) study. His study recommended the use of a preventive approach to FM operation and maintenance to reduce the incidence of breakdowns or malfunctions in a building.

Table 3: FM Operation and Maintenance Practice Techniques for Office Building

| FM Techniques | Rate of Adoption | | | | | TWV | WMS | Ranking |
|---|---|---|---|---|---|---|---|---|
| | N | S | ST | MT | A | | | |
| Blended Approach | - | 12 | 246 | 364 | 185 | 807 | 3.74 | 1 |
| Preventive | - | 78 | 216 | 324 | 120 | 738 | 3.42 | 2 |
| Corrective | - | 48 | 339 | 299 | 25 | 708 | 3.28 | 3 |

*Note: Never (N), Seldom (S), Sometimes (ST), Most times (MT), Always (A), Total Weighted Value (TWV), Weighted Mean Score (WMS).*

Table 4 shows the challenges faced in the operation and maintenance practice of facilities in the office building. Some prominent challenges were highlighted and categorised under broad terms such as technical, finance, administrative, and top management as documented in the literature (Rahman, Akasah, Abdullah, and Musa, 2017). The respondents were asked to indicate the level of severity of the challenges and their responses were analysed by the severity index model. The study revealed that in the category of technical, challenges associated with building design flaws, poor installation of equipment and obsolete facilities were the prominent ones having severity index of 68.80, 60.09, and 59.63% respectively.

For financial constraints, the inconsistency in financing maintenance, high cost of maintenance components, and low budget allocation with severity index of 79.81, 72.78, and 71.85% respectively were identified as the major challenges in the category. In the administrative category, weak standards and poor enforcement of standards (72.22%), absence of performance evaluation (68.33%), and lack of proper FM guidelines and requirements (68.15%) exhibited top-rated challenges. However, the prominent challenges in the top management categories were pointed out to be the indifferent attitude towards maintenance issues, the wrong perception of facility management, and lack of foresight with respective severity indexes of 71.85, 70.00, and 67.41%.

The result of the analysis implies that the FM practice is still faced with some critical challenges but at varying degrees and magnitudes. The technical challenges characterised by a flaw in building design, poor installation, and the use of outdated facilities among others can be attributed to the country's level of technology development. In developed countries, a large number of the design, engineering, and installation works are being carried out with the aid of advanced technology and spare/replacement part is readily available. However, the situation is different in developing countries like Nigeria. For instance, the United Nations Conference on Trade and Development (UNCTD) 2021 report on digital, technology and innovations rates Nigeria as 'underperformed' on frontier technologies among the developing countries. This report signals that most of the country's systems, structures, and practices are still operating at a basic level and labour intensive (UNCTD, 2021).

Furthermore, the financial constraints such as inconsistency and low budgetary allocation to the management and maintenance of facilities in an office building are prominent, especially among the non-corporate property owners/investors. The cases often arise when the owner operate a single account for rent and service charge. The issue of inflation causing a rise in maintenance cost of facilities in the building is a major threat to an effective and efficient FM practice, especially in an unstable economy like Nigeria.

Meanwhile, on the part of the administrative system, weak standards, poor enforcement and lack

of FM guidelines remain prominent challenges. The reasons that could attribute to this would include that the FM concept (FM) is still relatively young, not yet conform to the global best practice as a result of the weak institutional framework in Nigeria when compared to the operations and practice of FM in developed or fast developing countries. Similarly, indifferent attitude, wrong perception, lack of foresight, and low level of awareness on the part of the management team also constituted the factors that led to the challenge to the success of FM practice and consistency in the building performance. The result in Table 4 is further illustrated in Figure 3.

Table 4: Challenges of FM Operation and Maintenance Practice of Office Building

| Challenges | Level of Constraints | | | | | TWV | S.I (%) | Rank |
|---|---|---|---|---|---|---|---|---|
| | NS | LS | MS | S | VS | | | |
| • *Technical* | | | | | | | | |
| Building design flaws | 3 | 34 | 306 | 268 | 135 | 743 | 68.80 | 1st |
| Poor installation of equipment | - | 52 | 117 | 41 | 6 | 649 | 60.09 | 2nd |
| Obsolete facilities | - | 76 | 79 | 50 | 11 | 644 | 59.63 | 3rd |
| Unqualified maintenance contractor | 5 | 186 | 189 | 156 | 80 | 611 | 56.57 | 4th |
| limited technical knowledge among managers | - | 93 | 76 | 45 | 2 | 604 | 55.93 | 5th |
| • *Finance* | | | | | | | | |
| Inconsistency in financing maintenance | - | 17 | 43 | 81 | 75 | 862 | 79.81 | 1st |
| High cost of maintenance components | 3 | 68 | 195 | 188 | 335 | 786 | 72.78 | 2nd |
| Cutting down on maintenance cost | - | 23 | 69 | 97 | 27 | 776 | 71.85 | 3rd |
| Embezzlement of funds | - | 46 | 243 | 336 | 90 | 715 | 66.20 | 4th |
| • *Administrative* | | | | | | | | |
| Weak standards and poor enforcement of standards | - | 50 | 306 | 252 | 130 | 780 | 72.22 | 1st |
| Absence of performance evaluation | - | 50 | 306 | 252 | 130 | 738 | 68.33 | 2nd |
| Lack of proper FM guidelines and requirements | - | 74 | 231 | 336 | 90 | 736 | 68.15 | 3rd |
| Unclear job description and department structure | - | 136 | 186 | 276 | 85 | 688 | 63.70 | 4th |
| Absence of feedback mechanism | - | 162 | 288 | 120 | 45 | 662 | 61.30 | 5th |
| • *Top management* | | | | | | | | |
| Indifferent attitude towards maintenance issues | - | 23 | 69 | 97 | 27 | 776 | 71.85 | 1st |
| Wrong perception toward facility management | 1 | 88 | 201 | 212 | 255 | 756 | 70.00 | 2nd |
| Lack of foresight | 7 | 76 | 219 | 228 | 205 | 728 | 67.41 | 3rd |
| Lack of awareness | 9 | 110 | 198 | 164 | 225 | 697 | 64.54 | 4th |
| Lack of consideration for efficiency in service delivery | 12 | 130 | 189 | 212 | 115 | 646 | 59.81 | 5th |

*Note: Highly Severe (HS), Moderately (MS), Low Severe (LS), Not Severe (NS), Total Weighted Frequency (TWF), Mean Weighted Score (MWS)*

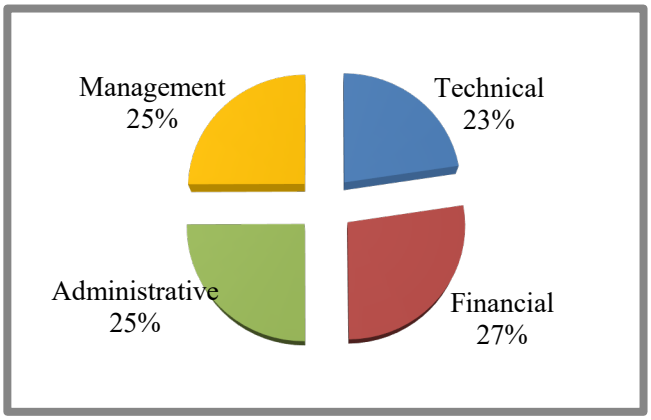


Figure 3: Average Severity Index

The study also conducted a test to know whether there is a significant difference in the opinions of the ESVs on the severity of the categorised challenges against the differences in their background information such as academic qualification, professional cadre, and work experience. To ascertain this, it employed the Kruskal-Wallis H test and it was discovered that there is no statistically significant difference in the opinions of the respondents (*KWT Asymp. p-value > 0.05 in all observed cases*). The result implies that the respondents share similar opinions on the severity of the challenges affecting the effective and efficient FM operation and maintenance practice of office buildings in the study area. The results as summarised in Table 5 indicate that facility management practice in Lagos state is characterised by some level of constraints that tends to have adverse effects on its operations and efficacy.

Table 5: Kruskal-Wallis Test H Test

| Challenges | Academic Qualification | | Professional Cadre | | Work Experiences | |
|---|---|---|---|---|---|---|
| | Chi-Square | KWT A.Sig. | Chi-Square | KWT A.Sig. | Chi-Square | KWT A.Sig. |
| Technical | 4.002 | .135 | 3.811 | .149 | 2.247 | .134 |
| Finance | 1.555 | .660 | 5.596 | .061 | 2.744 | .098 |
| Administrative | 5.446 | .660 | 4.721 | .094 | 1.421 | .233 |
| Top Management | 4.905 | .909 | 2.444 | .118 | 1.394 | .308 |

*Kruskal-Wallis Test (KWT); Asymp. significance level @ 5% (*)*

## 5.0 CONCLUSION AND PRACTICAL IMPLICATIONS

The study assessed the FM operation and maintenance practice of office buildings in Nigeria with a focus on Lagos state. Among the main objectives of the study are to examine the activities, techniques adopted, and challenges in the operation and maintenance management practice of facilities in office buildings. The members of NISEV constitute the study population and their responses were analysed by descriptive statistics. The study revealed that the activities often engaged in operation and maintenance management which include space management, power plant/electricity maintenance, waste management, lift maintenance, general cleaning services, routine maintenance, and water management. The preferred FM technique employed is the blended approach (combination of preventive and corrective FM techniques) in which there is a relatively higher indication of the use of the preventive method than the corrective measures. Meanwhile, the study also revealed that the challenges within the FM practice which include a flaw in building design, poor installation of equipment and obsolete facilities for the *technical category*; inconsistency in financing maintenance, high cost of maintenance components, low budget allocation for facility management for the *finance category*; weak standards and poor enforcement of standards, absence of performance evaluation & lack of proper FM guidelines and requirements for the *administrative category*; as well as the indifferent attitude towards maintenance issues, wrong perception towards facility management and lack of foresight by the top management.

Through the Kruskal-Wallis H test, it is shown that there is no statistically significant difference in the opinions between the respondents on the severe challenges faced in the FM practice of office buildings in the study. The study, however, concluded that the operations of the FM practice are still in the infancy stage and are characterised by the prominent challenges of technical, administrative, and finance aspects. However, being a multi-disciplinary profession, the study suggests efficient collaborative effort which can be strengthened by an institutional framework that would encourage human capacity development and enhance technology advancement to foster sustainable facilities management practice in Nigeria.

## 6.0 REFERENCE

1. Achoru, A. M. (2015). Effective facilities management through management information system: a case study of Industrial Training Fund building Abuja. *Journal of Technology Management*, 2(1), 3 – 9.

2. Adali, O. A., and N. Peter. Constraints in the management of school facilities for the actualization of vision 20:2020 in Ebonyi State, Nigeria. *International Journal of Multidisciplinary Research and Development* 2(10), 56-60.

3. Adenuga, O.A and Iyagba, R.O.A (2005). A strategic approach to maintenance practices for public buildings in Lagos State. *Journal of Environmental Studies*, 5(1), 23-25

4. Adewale, E. F (2015). Challenges of maintaining building facilities in selected public secondary schools in metropolitan Lagos. Unpublished Thesis, University of Lagos.

5. Alexander, K (2004). *Facilities Management: Theory and Practice*. London, New York: E&FN SPON

6. Ali, A. S. and Chua, S. J. L. (2016). Issues and Challenges in Implementation of Planned Maintenance. *The Malaysian Surveyor*. 46(4), 33-37

7. Aliyu, A. A. (2015). Application of facilities management practice in high rise commercial properties: Jos in perspective, *Civil and Environmental Research* 7(2) 10-19

8. Alshehri, A., I., Motawa, and S. Ogunlana. (2015). The common problems facing the building maintenance departments. *International Journal of Innovation, Management and Technology*. 6(3), 234-237.

9. Amarantunga D, Baldry D and Sarshar M (2000). Assessment for facilities management - What next? *Facilities*, 18(1/2), 66-75

10. Anker, J. P. (2010), "The Facilities Management Value Map: a conceptual framework", *Facilities*, 28(3/4), 175-188.

11. Atkin, B. and Brooks, A. (2009), *Total Facilities Management, (*3rd ed), Wiley-Blackwell, Hoboken, New Jersey, United States

12. Au-Yong, C. P., Ali, A. S. and Ahmad, F. (2013). Office building maintenance: cost prediction model. *Gradevinar*, 65(9), 803-809.

13. Au-Yong, P. C., Azlan Shah Ali, S. A., Chua, S. J. L. (2018). A literature review of routine maintenance in high-rise residential buildings: A theoretical framework and directions for future research. *Journal of Facilities Management*, https://doi.org/10.1108/JFM-10-2017-0051

14. Baek, J. G. (2017). An intelligent condition-based maintenance scheduling model. *International Journal of Quality & Reliability Management*, 24(3), 312-327.

15. Batun, S. and Azizoglu, M. (2009). Single machine scheduling with preventive maintenance. *International Journal of Production Research*, 47(7), 1753-1771.

16. Brackertz, N. and Kenley, K. (2002). A service delivery approach to measuring facility performance in local government. *Facilities.* 20(3/4), 127-135

17. Brien, O. T., Foster, O., Tucker, L. E. and Hegde, S. (2021). COVID response: A blended approach to studying sanitizer station deployment at a large public university. *Institute of Electrical and Electronic Engineering*, DOI: 10.1109/RWS52686.2021.9611795

18. Brooks, A. (2005). *Total Facilities Management (2nd ed.).* Oxford: Blackwell Publishing Ltd.

19. Burt, N. (2012). Facilities management: good practice guide, *Journal of Facility Management Association of Australia*, 1, 2 – 7.

20. Chinedu, P. N. and Oladejo, E.I (2019). Analysis of challenges of facilities management practice in selected manufacturing industries in Enugu State, Nigeria, *International Journal of Engineering Science and Computing,* 9(4) 21199-21206

21. Chotipanich, S. (2004) Positioning Facility Management, *Facilities*, 22 (13/14), 364-372.

22. Chukwu, E. D.; Okolie, K. C.; Ezekoli, F. O. (2020). Facilities management practices in Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Anambra State, Nigeria; *PM World Journal*, 9(3), 1-20

23. Fadahunsi, J. O. Utom, J. A. Ochim, M. R. Ayedun, C. A. and Oloke O. C. (2018). Benefits of the Adoption of Facilities Management Practices in Tertiary Institutions: A Case Study of Covenant University. *Materials Science and Engineering* 640 (2019) 012032 doi:10.1088/1757-899X/640/1/012032

24. Fouladgar, M. M., Yazdani-Chamzini, A., Lashgari, A., Zavadskas, E. K. and Turskis, Z. (2012). Maintenance strategy selection using AHP and COPRAS under fuzzy environment. International. *Journal of Strategic Property Management*, 16(1), 85-104.

25. Garg, A. and Deshmukh, S. G. (2011). Maintenance management: literature review and directions. *Journal of Quality in Maintenance Engineering*, 12 (3), 205 – 23

26. Goyal, S. and Pitt, M. (2007) Determining the Role of Innovation Management in Facilities Management, *Journal of Facilities Management,* 25 (1/2), 48-60.

27. Ho, D.C.W., Chan, E.H.W., Wong, N.Y. and Chan, M. (2000). Significant metrics for facilities management benchmarking in the Asia Pacific region. *Facilities*, 18(13/14), 545-556

28. Horner, R. M. W., El-Haram, M. A. and Munns, A. K. (2014). Building maintenance strategy: A new management approach. *Journal of Quality in Maintenance Engineering*. 3(4), 273-280.

29. Hsieh, H.R. (2009). Issues and proposed improvements regarding condominium management in Taiwan. *Habitat International,* 33(1), 73-80.

30. Jensen, P.A. (2008). The origin and constitution of facilities management as an integrated corporate function. *Facilities*, 26(13/14) 490 - 500

31. Koleoso, H.A., Omirin, M.M. and Adewunmi, Y.A. (2015). Comparison of the nature and strategic features of facilities management and other building support practices in Lagos. ATBU *Journal of Environmental Technology* 8(2), 11-29

32. Lee, H. H. Y. and Scott, D. (2017). Overview of maintenance strategy, acceptable maintenance standard and resources from a building maintenance operation perspective. *Journal of Building Appraisal*, 4(4) 269-278.

33. Moghaddam, K. S. and Usher, J. S. (2010). Optimal preventive maintenance and replacement schedules with variable improvement factors. *Journal of Quality in Maintenance Engineering*, 16(3), 271-287.

34. Moore, M. and Finch, E. (2004) Facilities Management in South East Asia, *Facilities,* 22(9/10), 259-270.

35. Nedolisa, J.I and Egolum, C.C. (2019). Assessment of facilities management practice in the hospitality industry in Anambra state using Nigerian tourism development corporation standards. *ICONIC Research and Engineering Journals,* 2(11), 251-273

36. Nielsen, B. S., Jesen, O. J. and Jensen, A. P. (2009). Delivering Sustainable Facilities Management in Danish Housing Estates. *II International Conference on Sustainability Measurement and Modelling.* CIMNE, Barcelona, Spain.

37. Nik-Mat, N.E.M., Kamaruzzaman, S.N. and Pitt, M. (2011). Assessing the maintenance aspect of facilities management through a performance measurement system: A Malaysian case study. *Procedia Engineering*, (20), 329-338.

38. Ojo, P. K. (2002). Property Management and Facilities Management any difference; Nigerian Institution of Estate Surveyor and Valuers Lagos Branch, *presented at Continuing professional development seminar on facilities Management in Nigeria* September 4, Nigeria Federal Palace Hotel, Lagos, Nigeria

39. Oladokun, T. T. (2011). An examination of the practice of facilities management in Nigeria, *Journal of International Real Estate and Construction Studies*, 1(2) 167-179

40. Olagunju R.E. (2016). Sustainability of residential buildings in Nigeria: an appraisal of the factors that influence the maintenance of residential buildings' standards: *Civil and Environmental Research Journal*, 2(4) 1-15

41. Olanrewaju, A.L., Idrus, A. and Khamidi, M.F. (2011). Investigating building maintenance practices in Malaysia: a case study. *Structural Survey*, 29(5) 397-410

42. Organisation for Economic Cooperation and Development (OECD 2018). Blended Finance Funds and Facilities. OECD Development Co-operation Working Papers. https://doi.org/10.1787/22220518

43. Outubro (2011). The Application of Facility Management tools to office building's technical maintenance. Unpublished extended abstract. Universidade Técnica De Lisboa Instituto Superior Técnico

44. Rahman, M. A. A., Akasah, Z. A., Abdullah, M. S. and Musa. M. K. (2017). Issues and Problems Affecting the Implementation and Effectiveness of Heritage Buildings Maintenance. The International Conference on Civil and Environmental Engineering Sustainability, Johor Bahru, Malaysia

45. The British Institute of Facilities Management (BIFM, 2010) Reports. *Retrieved from* http://www.bifm.org.uk/bifm/home

46. Thomson, T. (2010). The essence of facilities management, *Facilities* 8(5), 8-12.

47. United Nation Conference on Trade and Development. (2021). From Recovery to Resilience: The Development Dimension. Trade and Development Report 2021: Retrieved from United Nation Conference on Trade and Development: https://unctad.org/webflyer/trade-and-development-report-2021

48. United States Bureau of Labour Statistics (USBLS, 2022). Administrative Services and Facilities Managers. Office of Occupational Statistics and Employment Projections, United States Department of Labour, Washington, DC. https://www.bls.gov/ooh/management/administrative-services-managers.htm