STUDENT'S SATISFACTION LEVEL OF BUILDING FACILITIES MAINTENANCE IN FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

BY

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2016/1/63738TI

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY MINNA,
NIGER STATE

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION FEDERAL UNIVERSITY OF TECHNOOGY, MINNA

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DECLARATION

I, Samuel Johnson with matriculation number 2016/1/63738TI an undergraduate student of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other University.

Samuel Johnson _____

2016/1/63738TI Signature & Date

CERTIFICATION

This project has been read and approved as meeting the requirements for the award of B. Tech degree in Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna.

Dr. A.B Kagara _____

Supervisor Signature/Date

Dr. T.M Saba _____

Head of Department Signature/Date

_____ _____

External Examiner Signature/Date

DEDICATION

I dedicate this work to God Almighty and my parents.

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My sincere gratitude goes to Almighty God for the strength and help granted to me throughout my academic years. I would like to extend my gratitude to my research supervisor Dr. A.B Kagara for his guidance and assistance given towards this research work. I also acknowledge my H.O.D Dr. T.M Saba, Dr. G. A. Usman, Dr. C. O Igwe and Dr. Dauda Ibrahim and all other lecturers and staff for their contributions in one way or another to the success of this work.

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ABSTRACT

This study was designed to investigated the student's satisfaction level of building facilities maintenance in the Federal University of Technology, Minna. Three research questions and two hypotheses tested at 0.05 level of significance for the study. A survey research design was adopted for the study. The population consists of 233 students of Federal University of Technology, Minna, 155 male students and 78 female students. A 4-point scale 38 items questionnaire validated by three (3) lecturers from the Department of Industrial and Technology Education, Federal University of Technology Minna was used for data collection. Mean, standard deviation and t-test statistical tool (SPSS) were used for data analysis. Findings reveals that student's satisfaction level of building facilities maintenance with hostel accommodation is poor and inefficient. It also reveals that the satisfaction of building facilities maintenance on classroom/ lecture theatre is inadequate but average. Furthermore, there is a significant different between the mean response of the male and female students on the extent of maintenance system adopted on building facilities and there is no significant difference between the mean response of the male and female students on the strategies for improving maintenance of building facilities. It is therefore concluded that there is lack of: building operation and maintenance policy that are used in the practices of building facilities maintenance, professional experts in building facility maintenance, proper planning in facility management, training for building maintenance staffs, regular building condition survey, technologies like computerized maintenance system to simplify building facility management practice, specific organization or separate body that provides guidelines and preventive building maintenance type in public tertiary institution. Based on the findings, it was recommended that the Rearrangement of the organization structure of facility maintenance in public tertiary institution and adequate fund be allocated for the purpose of maintenance regularly to help improve the quality of maintenance enabled in facilities maintenance system adopted in Federal University of Technology, Minna, in Niger State.

TABLE OF CONTENT

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATION

Tables **LIST OF TABLES** **Pages**

Figure **LIST OF FIGURES** **Pages**

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Nigeria as a country has a total of 170 universities. As of 2021, 79 were private, Federal universities amounted to 43 including 4 Federal universities of technology, while state universities were 48, (Statista 2021). Education at all levels, including universities, is meant to develop the whole individual—the head, heart and hand—or in educational terms, cognitive, affective and psychomotor. The value and benefit of education, particularly university education, is not limited to the individual only, but extends to the society and the country as a whole. Universities are undeniably significant; they are instruments of social and economic change (Tirronen & Nokkala, 2009). They are key institutions that produce and transmit knowledge and produce workforce for the needs of the society (Sukirno & Siengthai, 2011; Tirronen & Nokkala, 2009). In other words, universities help a country to develop the intellectualism and employability of its citizens (Zakaria & Wan Yusoff, 2011). Universities are engines that propel the economy of every country; hence they affect every area of national development (Chauhan, 2008). Additionally, universities play an indispensable role in the innovation system, economic development and the competitiveness of every country (Tirronen & Nokkala, 2009). Unquestionably, university education accelerates the pace of development of a country (Chauhan, 2008).

The prominent objective of any university is to promote teaching, learning and research activities (Mat, Sopian, Moktar, Ali, Hashim, Rashid, Zain & Abdullah, 2009; Zakaria & Wan Yusoff, 2011). Universities cannot meet these objectives effectively without buildings facilities (e.g. lecture theatres/rooms, laboratory, library, workshop, hostels e.t.c) (Olanrewaju, Khamidi & Arazi, 2011a). Buildings, in fact, are regarded as the largest and one of the most important physical assets of any university (Olanrewaju, 2010a; Olanrewaju, Khamidi & Arazi, 2010a;

Olanrewaju et al., 2011a; Olanrewaju, Khamidi & Arazi, 2011b). Buildings function as an enabling resource and facilitator (Douglas, 1996); consequently, the entire learning process in a university is facilitated by its building facilities. Olanrewaju (2010a) and Olanrewaju et al. (2011a) emphasised that university buildings are procured to create a stimulating environment to support and encourage learning. However, buildings do not remain new forever and therefore requires management/ maintenance to ensure continued performance (Olanrewaju, 2010b). The performance of a building relates to how the building contributes to fulfilling the expectation and functions required by the building users (Stanley, 2001; Williams, 1993). Douglas (1996) contended that the performance of buildings has direct impact on end users. Accordingly, the performance of a building is affected by the ways it is been managed (Drouin, Hinum, Beeton, Nair and Mayfield, 2000). In fact, a well-managed building is vital for delivering the core objective of any university: education (Olanrewaju, 2010a). This work aims at ascertaining the management of the facilities provided within the premise of the Federal University of Technology, Minna with a view to assess the level of satisfaction of the students with the available building facilities.

Facilities management (FM) is geared towards providing facilities services (Barrett and Baldry, 2003) and the function of facilities managers should be that of managing facilities in the best interest of the core business. These opinions present the view that there is relationship between organizational objectives or goals with facilities management function. Further, Amaratunga and Baldry (1998) proposed that the aim of facilities management should not be just to optimize the running cost of buildings but also increase the efficiency of the space management and other related assets (people and processes). Therefore, to achieve organizational mission or goal, the combination of cost and efficiency is required (Amaratunga and Baldry, 2000). Literature review in facilities management shows there is considerable agreement on the importance of FM in achieving organizational objectives in both

manufacturing and service organization. FM is often foreseen as an enabler to enhance organizational resources in a competitive and efficient way.

Buildings, technology and human resources are the interrelated assets of every university (Olanrewaju et al., 2011a). Buildings are perceived as the second most important asset of a university after the human resources (Olanrewaju, 2010a; Olanrewaju, 2010b). In fact, they are the major capital asset of a university (Chartered Institute of Building, 1990). Olanrewaju (2010a) and Olanrewaju et al. (2011a) explained that buildings are a source of value creation in a university if they facilitate the required services of teaching, learning and research activities. Chartered Institute of Building (1990) elaborated that buildings principally exist to satisfy the needs of the users. Quintessentially, university building facilities must provide an environment which supports and stimulates teaching, learning and research activities (Olanrewaju, 2010a; Olanrewaju, 2010b). But buildings cannot be maintained and restored to a condition at which they continue to perform or fulfil their functions unless management is carried out (Seeley, 1987). Effective building management is vital for ensuring the provision of better built environments for users (Lee & Scott, 2009a).

Unfortunately, there is a general lack of concern for building management (Chanter & Swallow, 2007; Chartered Institute of Building, 1990; Lee & Scott, 2009a; Lee & Wordsworth 2001). Building management is usually perceived as a non-core (Olanrewaju et al., 2011a), a "Cinderella" activity (Seeley, 1987), unproductive (Lam, 2000; Seeley, 1987), unattractive (Lee & Scott, 2009a), and seen to possess little glamour (Seeley, 1987). In addition, building facility management has constantly been treated as the "poor relation" of the construction industry (Lee & Wordsworth 2001); hence, it is prioritized quite low (Chartered Institute of Building, 1990; Lam, 2000; Lee & Scott, 2009a) and attracts only an implicit recognition of its importance (Chanter & Swallow, 2007; Lee & Wordsworth, 2001). Other factors including

inadequate funds, poor management of funds, poor strategies, insufficient proactive maintenance strategies and an absence of commitment from top and middle level management further exacerbate the problems of building management (Drouin et al., 2000; Smith & Hinchcliffe, 2004). Lee & Wordsworth (2001) added that situations may exist in an institution where management ignores the roles of buildings or considers them a burden. Buys and Nkado (2006) opined that maintenance management is neglected by the top management of tertiary educational institutions in Nigeria. This neglect and lack of concern result in under-resourcing of management which further affects building facilities (Chanter & Swallow, 2007). These assertions are confirmed by the results of a survey conducted by Buys and Nkado (2006) which revealed that the performance of existing maintenance management systems in Nigeria tertiary institutions is below best practice standards. Facilities management as an emerging profession and the practice has advanced in many of the developed countries but still in its elementary stages in Africa and other developing countries. It is a profession which includes multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology (Ogebeifun, 2011).

1.2 Statement of the Problem

The background suggests that not much attention is given to building facilities maintenance at top management level, resulting in under-resourcing of building management activity. Apart from under-resourcing, reduction is occasionally made to the maintenance and management budget which affects the building facilities of the institutions. On the other hand, maintenance is carried out to ensure that buildings support the needs of the students, with the aim that their satisfaction and productivity are enhanced. Therefore, the problem is this: managing building facilities such as lecture theatres, hostels, cafeteria, library, laboratory, with budget constraints, at a performance level that meets the satisfaction of students and promotes their learning experience. The question to be addressed in the study is as follows: “Considering that the

budgets allocated for the purpose of building facility maintenance are low and occasionally reduced even further, what strategies could be adopted for maintaining university building facilities to ensure student satisfaction

1.3 Purpose of the Study

The main purpose of study is to determine students' satisfaction level of the building facility maintenance in the Federal University of technology Minna, Niger state.

specifically, the study intends to:

I. Investigate the student's satisfaction with hostel accommodation maintenance in Federal University of Technology, Minna.
II. Investigate the student's satisfaction with classroom/lecture theatre maintenance in Federal University of Technology, Minna.
III. Determine the improvement strategies for building facilities maintenance in Federal University of Technology, Minna**.**

1.4 Significance of the Study

The study will be of great importance to the following groups, students, lecturer, FUT Minna and other tertiary institution.

The study will be of great importance to the institution. That will help the institution to correct, restore, maintain the faulty building before it gets out of hands and also give an aesthetic and retain the value of the investment for the institution. It saves the cost of erecting/constructing new structure when estimation of the cost of materials are very high and considered the unpredictable rate of inflation and short of fund.

As for the students, they will have very conducive learning environment, feel safe, whereby there is no fear of inadequacy of building service and also in health wise. This will go a long way in keeping standard of the institution and the development of the university and as well

the country. The government will also benefit in aspect of maintaining their assets as respectable, worthwhile as the building last long.

1.5 Scope of the Study

The study examined the student satisfaction level of building facility maintenance within Federal University of Technology, Minna. It covers Hostels, classrooms, and lecture theatres because of inconvenience and time frame for the study.

1.6 Research Question

I. To what extent does the students satisfy with hostel accommodation maintenance in Federal University of Technology, Minna?

II. To what extent does the students satisfy with classroom/lecture theatre maintenance in Federal University of Technology, Minna?

III. What are the strategies for improving maintenance of building facilities in Federal University of Technology, Minna?

1.7 Hypothesis

The following null hypothesis where formulated at 0.05 level of significance.

$H0_1$ There is no significant difference between the mean response of the male and female students on the extent of maintenance system adopted on building facilities in Federal University of Technology Minna.

$H0_2$ There is no significant difference between the mean response of the male and female students on the strategies for improving maintenance of building facilities in FUT Minna

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the related literature under the following subheadings:

1. Facility Management
2. Building Facility Maintenance
3. Aim of Building Facility Maintenance
4. Important Factors to fulfill the aim of Building Facility Maintenance Systems in Federal University of Technology Minna
5. The Strategies for Facility Maintenance Unit and Structure in Federal University of Technology Minna
6. Needs for students' satisfaction on Building Facilities in Federal University of Technology Minna
7. Summary of the Chapter

2.1 Conceptual Framework

Facilities management is defined and analyzed in a variety of ways by associations and authors of books. The following selected definitions are based on a survey conducted via the internet to provide an overview of what facilities management is as perceived internationally by facility management associations:

I. International Facilities Management Association (IFMA)

IFMA is a very comprehensive association, providing comprehensive input and educational opportunities in the discipline. The IFMA (2010) defines: Facility management is a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology (International Facilities Management Association, 2008).

II. Facilities Management Association (UK) (FMA)

The following definition is provided by FMA: Facilities Management is located in the support services sector of the UK economy and is the efficient integration of support activities within the business environment which is essential to the successful performance of any organization‖ (Facilities Management association in UK, 2010).

III. British Institute of Facilities Management (BIFM)

BIFM (2010) defines facilities management as follows: Facilities management is the integration of processes within an organization to maintain and develop the agreed services which support and improve the effectiveness of its primary activities‖ (British Institute of Facilities Management, 2010).

IV. Facility Management Association of Australia (FMAA)

The FMAA definition of facility management is stated by Best et al (2003:1) as follows: Facility management is the practice of integrating the management of people and the business process of an organization with the physical infrastructure to enhance corporate performance. According to Best et al (2003): the broad categories of FMAA competencies are listed as follows):

- Use organizational understanding to manage facilities
- Develop a strategic facility response
- Manage risk
- Manage facility portfolio
- Improve facility performance
- Manage the delivery of services
- Manage projects
- Manage financial performance

- Arrange and implement procurement/sourcing
- Facilitate communication

V. South African Facilities Management Association (SAFMA)

The SAFMA (2010) provides the following definition: Facilities management is an enabler of sustainable enterprise performance through the whole life management of productive workplaces and effective business support services (South African Facilities Management Association, 2010).

VI. Atkin and Brooks (2009): see Facilities Management as; Creating an environment that is conducive to carrying out the organization's primary operations, taking an integrated view of the services infrastructure, and using this to deliver customer satisfaction and best value through support for and enhancement of the core business. Further, they develop this definition to describe facilities management as something that will:

- Support people in their work and in other activities.
- Enhance individual well-being.
- Enable the organization to deliver effective and responsive services.
- Sweat the physical assets, that is, make them highly cost-effective.
- Allow for future change in the use of space.
- Provide competitive advantage to the organization's core business.

Barret and Baldry (2009) provide the following definition of facilities management: An integrated approach to maintaining, improving and adapting the buildings of an organization in order to create an environment that strongly supports the primary objectives of that organization.

The above definitions suggest that facilities management provides a supporting management function to the core business of an organization; concentrates on the area of interface between physical workplace and people; and requires a multi-skill approach to integrate people, place, process and technology in executing its support functions. For underpinning this study, the Barret and Baldry (2003) definition was taken; An integrated approach to maintaining, improving and adapting the buildings of an organization in order to create an environment that strongly supports the primary objectives of that organization.

2.2 Building Facility Management

According to Barret and Baldry (2003) building facility management is a management system used to operate and maintain the buildings of an institution in order to create an environment that strongly supports the primary objectives of that institution.

2.3 The Aim of Building Facility Maintenance

The general goal of building facility maintenance is to ensure the provision of attractive buildings, with properly functioning components and systems, that are properly operated, maintained and that provide surroundings and conditions conducive to quality instruction and learning. To fulfill the general goal of facility management unit (Atkin and Brooks, 2009):

- Identify and correct facility deficiencies and needs through periodic review of existing systems and system components,
- Maintain buildings at a level that ensures facilities that are aesthetically pleasing, clean, sanitary, and safe and
- Manage facilities in a manner which minimizes usage conflicts, overcrowding, and retrofit costs.
- Ensure the availability of sufficient funding and other resources to support projected facility maintenance requirements

2.4 Building Operation and Maintenance

In general, maintenance means to hold, keep, sustain or preserve the building or structure to an acceptable standard. Acceptable standard is defined as one which sustains the utility and value of the facility. The question of what is an acceptable standard is a matter of assumption and is generally subjective. Each owner or tenant will have to establish his/her own standards based on many factors, such as (Whole Building Design Guide, 2008).

- Usage of building
- Expected life
- Availability of capital, materials and manpower
- Change in usage and personal

Types of Building Maintenance

British Standard 3811 classified building maintenance as follows:

1. Planned Maintenance: The maintenance organized and carried out with forethought, control and the use of records to a predetermined plan
2. Unplanned Maintenance: The maintenance carried out to no predetermined plan.
3. Preventive Maintenance: The maintenance carried at predetermined intervals or corresponding to prescribed criteria and intended to reduce the probability of failure or the performance degradation of an item.
4. Corrective Maintenance: The maintenance carried out after a failure has occurred and intended to restore an item to a state in which it can perform its required function.
5. Emergency Maintenance: The maintenance which it is necessary to put in hand immediately to avoid serious consequences. This is sometimes referred to as day-today maintenance, resulting from such incidents as gas leaks and gale damage.

6. Condition-based Maintenance: The preventive maintenance initiated as a result of knowledge of the condition of an item from routine or continuous monitoring.
7. Scheduled Maintenance: The preventive maintenance carried out to a predetermined interval of time, number of operations, mileage, etc.

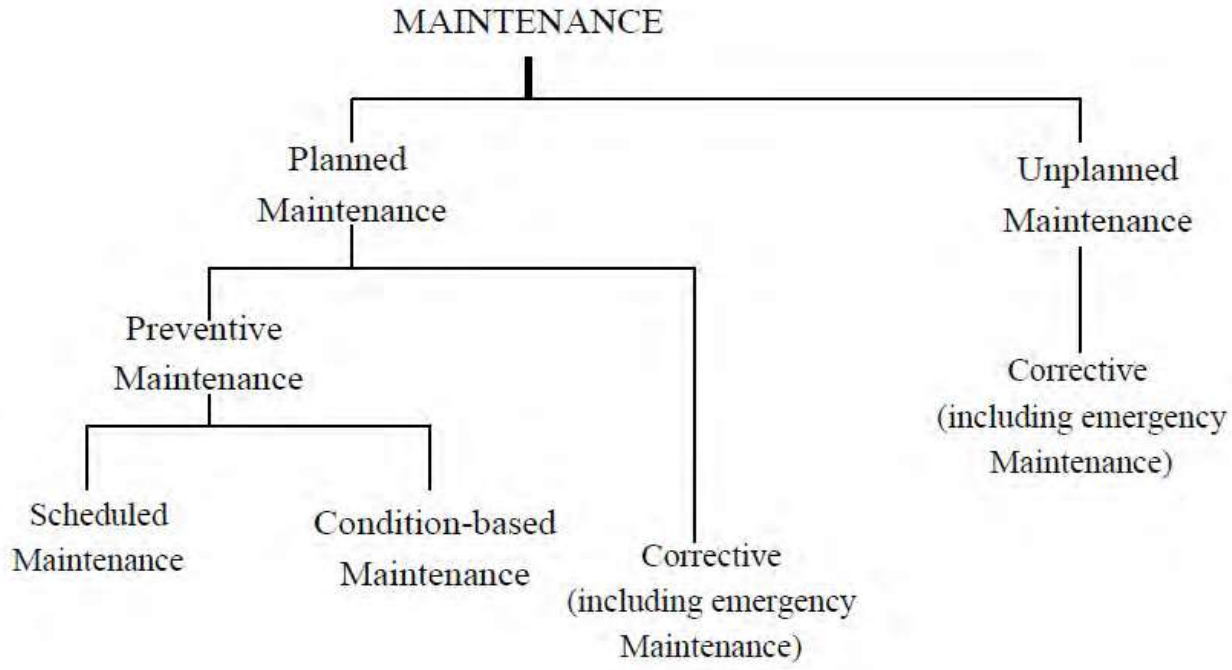

Figure 2.1 Classification of building maintenance type

Source :(Whole Building Design Guide, 2008)

2.5 Important Factors to Fulfill the Aim of Building Facility Management Systems in Federal University of Technology, Minna (FUT).

- **Building Operation and Maintenance Policy**

Building maintenance policy is a written document, and provides a management framework for the maintenance personnel to determine appropriate maintenance strategy and standard. Building maintenance policy and strategy are one of the main aspects of management of building maintenance operation processes. The three essential elements for formulating the maintenance policy are the choice of maintenance strategies, defining maintenance standards

and allocation of maintenance resources. Maintenance activities could not be planned and implemented successfully without the understanding of these elements (Chanter, 1996).

Maintenance strategy in general includes corrective, preventive or condition-based maintenance. However, there are different views on choosing appropriate maintenance strategy. Among various maintenance strategies, the effectiveness of planned preventive maintenance (PPM) is more challenged by the top management. Moreover, maintenance standard is difficult to agree with top management. Acceptable maintenance standard depends very much on available maintenance resources with consideration of common factors such as characteristics related to building, tenant, technical, administrative and political factors (Chanter, 1996).

Maintenance personnel at operational level argue that the maintenance budget is always below the needs. On the contrary, top management at the strategic level criticizes inefficiency of the maintenance organization. It is becoming more difficult to get more resources. Technology becomes a tool for assisting maintenance personnel to improve building maintenance operation efficiency. It is recommended to use intelligent equipment and automatic maintenance scheduler to enhance maintenance, quality and efficiency (Chanter, 1996).

Maintenance is defined as work undertaken in order to restore every facility, that is, in every part of the site or building to an acceptable standard. Maintenance policy is a tool for maintenance personnel to plan their appropriate maintenance strategies. However, before maintenance program is prepared, maintenance personnel and top management are required to agree on maintenance policy because it requires strategic directions, as well as resources. The maintenance policy consists of five major components, and different maintenance strategies are developed from these components. Without defining this policy, maintenance, operational processes will be in a disorganized order. According to Chanter (1996), the five major components) are as follows:

I. The length of time for maintaining for their present use

II. The life requirements of the buildings and their fittings and services.

III. The standard to which the building and its services are to be maintained

IV. The reaction time required between a defect, occurring and a repair being carried out.

V. The legal and statutory requirements shall also be considered

Training for Building Maintenance Staffs

Training is considered a vital element of operation & maintenance for new personnel; especially when new equipment is installed or emerging technology is being employed. Important to the overall facility management program, facilities personnel must be properly instructed and motivated. Training courses will familiarize personnel with the procedures necessary to operate and maintain complex systems and equipment, often using the system-level O&M manual as a basis of information. O&M manuals, likewise conducive for use in training, can be required as both paper and as an 'on-line' interactive electronic manual (IEM). Training should be ongoing to keep up with technology and equipment (Whole building design guide, 2010).

- **Information Technology**

According to Barret and Baldry, facilities manager deal with the collection of information technologies and applications which can potentially support him in his role. For example, there are software packages which can support accommodation planning, heating and ventilation, asset tracking and capital project management. The complexity of IT can be reduced by viewing all information technologies as consisting of one or more of the following basic information handling capabilities; information capture, information storage, information manipulation and information distribution. Computer aided design /CAD, for example, allows

the facilities manager to capture, store, manipulate and distribute drawings and related information. This facility is particularly useful as it allows the facilities manager to maintain and standardize a complete set of plans for the organization's building stocks (Barret and Baldry, 2009).

Computer-based information systems promote and enable; more efficient use of information at all managerial levels, improved decision making, improved managerial responsiveness, improved learning capacity and capability. These benefits will ultimately enhance both the quality and cost effectiveness of the services provided by the facilities management function. (Whole Building Design Guide, 2011).

Computer-aided Facilities Management (CAFM) includes the creation and utilization of information technology (IT) -based systems in the built environment. A typical CAFM system is defined as a combination of Computer-Aided Design and/or relational database software with the specific abilities for Facilities Management (Whole building design guide, 2010).

The purpose of a CAFM system includes:

- To help the facility's manager ensure the organization's assets are fully utilized at the lowest possible cost, while providing benefit to every phase of a building's life cycle.
- To support operational and strategic facility management, i.e. all of the activities associated with administrative, technical, and infrastructural FM tasks when the facility or building is operational, as well as the strategic processes for facilities planning and management.

CAFM systems consist of a variety of technologies and information sources that may include object-oriented database systems, CAD systems, Building Information Models (BIM), and interfaces to other systems such as a Computerized Maintenance Management System (CMMS). Today, most CAFM systems are web-based and provide a host of features including facilities related scheduling and analysis capabilities. Data may be collected from a variety of

sources through technology interfaces or human transfer processes. Data may be stored, retrieved, and analyzed from a single data-store. CAFM systems combine and analyze complex data to improve FM practices throughout a variety of industries including government, healthcare, educational, commercial, and industrial environments. The CAFM system gives decision makers the ability to automate many of the data-intensive facility management functions and typically results in continuous cost savings and improved utilization of assets throughout their entire lifecycle (Whole building design guide, 2010).

Although there is no ideal model suitable for all situations, to meet the specific demands of the facility manager, a well-developed CAFM system will often include a variety of functions and features. CAFM systems typically provide and maintain information on floor plans, property descriptions, space utilization, energy consumption, equipment locations, and other critical infrastructure data that pertain to the sector it is serving (Whole building design guide, 2010).

Computerized Maintenance Management Systems (CMMS) is software that is used to schedule and record operation and preventive/planned maintenance activities associated with facility equipment. The CMMS can generate and prioritize work orders and schedules for staff to support "trouble" calls and to perform periodic/planned equipment maintenance. Upon completion of a work order, performance information, such as the date work was performed, supplies/inventory, and many hours expended, typically is loaded into the database for tracking, to support future operations/planning.

CMMS is used by facilities maintenance organizations to record, manage, and communicate their day-to-day operations. The system can provide reports used in managing the organization's resources, preparing facilities key performance indicators (KPIs) to use in evaluating the effectiveness of the current operations, and for making organizational and personnel decisions. In today's maintenance world, the CMMS is an essential tool for recording work requirements, tracking the status of the work, and analyzing the recorded data in order to

manage the work, produce reports, and help control costs. Facility professionals use tools to manage the planning and day-to-day operations and maintenance activities required for a single facility or a large complex. These tools also provide all of the information required to manage the work, the work force, and the costs necessary to generate management reports and historical data (Whole Building Design Guide, 2008).

- **The Strategic Planning in Facility Management**

Managing facilities efficiently and effectively requires that a tough strategy is developed within the context of the organization's business plan. These should involve development of strategic objectives and a plan for the facilities management, with proper reference to the overall business plan within which it might be contained. A strategy (or business plan) for facilities management include (Atkin and Brooks, 2009);

I. Consider the needs of the organization, differentiating between core and non-core business activities;
II. Analyze existing facilities in depth including location, capability, utilization and condition; and an achievable and affordable (approved) plan that translates the goals of the business plan into an appropriate facility response.
III. Identify and establish effective and manageable processes for meeting those needs;
IV. Establish the appropriate resource needs for providing services, whether obtained internally or externally;
V. Identify the source of the means to finance the strategy and its practical implications;
VI. Establish a budget covering short term needs and best value over the long term; and recognize that management of information is key to providing a basis for effective control of facilities management.

- **Relationship between Facilities Maintenance and Strategic Planning**

According to Barret and Baldry (2003), there are four possible relationships that could exist between facilities maintenance and corporate strategic planning.

a) Administrative linkage, facilities maintenance provides day-to-day operating support, but is itself relatively unimportant in the planning process.
b) One –way linkage, facilities maintenance largely reacts to corporate strategic initiatives.
c) Two-way linkage, in which there is reciprocal and interdependent relationship between facilities maintenance and the corporate strategic planning process. Here facilities management is viewed as credible and important. It is proactive and fully involved in helping guide the development of strategic plans. For example, the facilities manager would be asked to evaluate potential acquisitions and help plan their integration into existing facilities.
d) Integrative linkage, the highest level of integration in which there is a dynamic, ongoing dialogue, both formal and informal, between the facilities management planners and corporate planner's. At this level the facilities manager would be involved in all strategic business decisions, even those that do not directly concern the facility function.

2.6 The Strategies for facilities Maintenance Unit and Structure in Federal University of Technology Minna (FUT)

There are various ways to organize the facilities department basically there is no one method that will guarantee success. Bearing that in mind, the following points should be taken into consideration when organizing facilities department (Barret and Baldry, 2003).

i. The size of the organization is the starting point for deciding how any facilities department is to be structured. Different sized organizations will require different staffing levels. If an organization is quite small and located in just one building, for example, there is probably no need for a full time facilities manager, as the amount of facilities work under taken will be minimal. At other end of the scale, a large organization may need correspondingly large facilities department.

ii. Location also is important. If a facility department is dealing with multiple sites it will undoubtedly require a different approach to one operating on a single site. With multiple site organization, the facilities manager will have to decide whether services are to be provided on centralized or decentralized basis.

iii. Another major consideration for the facility manager is what services should be provided by the facilities department. Again there is not definitive guide as to what should be included .For example, vary considerably in their choice of functions, some concentrate primarily on maintenance .Whilst others include general office services as a rough guide, any facilities department is likely to perform some of the activities listed in Figure 2.1 however facilities managers should not just select items from the list at random, but provide only those services that are needed by their particular organizations. Once established, facilities departments do not have to limit themselves to their original activities and so the list can be extended as necessary. A further decision to be made relating to the choice of services is whether they are to be provided in house or contracted out.

It is found that Facilities maintenance can be structured in any one of five categories or models, namely:

1. Office manager: In this model, the Facilities maintenance function is not a full time assignment, but undertaken by someone as part of their general duties. The person

charged with this responsibility may not be technically literate or actively involved in the core function of the organization, but could undertake this additional responsibility. The facilities functions, mainly repairs, are executed through external service providers as the need arises. This model is suitable for a small organization.

2. Single site: This model depicts organizations in one location, but large enough to create a separate unit responsible for the maintenance of its physical assets. The organization may use a combination of in-house and contracted services in the execution of the Facilities maintenance functions. A manufacturing plant, independent school and independent retail outlet, are good examples.
3. Localized site: This model is suitable for organizations that have facilities in different locations, but operate central maintenance control of their core functions from one site headquarters. This model is suitable for universities or other educational institutions with multi campuses, banks, hospitality industry, etc. This model encourages partial decentralization of operations that allows a certain level of decision to be made at each site level, with major policy taking place at the central management level.
4. Multiple sites: This model, similar to the localized site, is suitable for large organizations that operate across widely separated geographic locations, but perform identical functions in each site. Each site accommodates a functional Facilities Management Office, while the activities are coordinated at strategic levels of effective maintenance. Generally, health service institutions, military barracks, parks and historic sites are good examples. The model operates a structured coordinated from national through to local levels.
5. International. This model is similar to the previous, except that it operates across different countries. Allowance should be made to accommodate possible differences

between the countries involved in terms of language and legislation (Barrett and Baldry, 2003).

The organizational structures discussed above are dynamic, reflecting the growth pattern of the organization. A typical facilities maintenance unit starts from either the office manager or the Single Site model and expands to other models. The single site structure appropriately describes the structure of facilities maintenance units in the formative years of any institution of higher education. Many universities commenced operation from a temporary site before moving to their permanent site, which is usually in one location with progressive development. Through the process of expansion, merger and acquisition, many universities operate from multiple sites and by extension adopt the Localized Site structure.

2.7 Needs for students' satisfaction on building facilities in FUTMINNA

There are four generic clusters or categories of personnel needed in a Facilities maintenance Unit, namely; senior management, middle level management staff and technicians. Opinions have been expressed in literature that Facilities maintenance do not necessarily need to possess technical skills, but that modern management skills are essential, since their main function is to coordinate and integrate the activities performed by a multi-disciplinary network (Barret and Baldry, 2003).

Facilities manager could not be anybody with modern maintenance skills, but needs to be a certified professional who demonstrates a high level of competence in their areas of expertise. To support this, professional requirements for practitioners as stipulated by International Facilities Management Association (IFMA) and the Facilities Management Association of Australia (FMAA) which include a demonstration of knowledge, competence and ability in a wide range of technical and management areas (Ogebeifun, 2011).

The level of sophistication of infrastructure and technology supporting the core functions of the organization and huge investments in their development suggest strongly that Facility

Managers should be professionals, competent and expert in the maintenance of these support facilities. The quality of the support services has direct impact on the output of the core functions of an organization. Therefore, Facilities Managers in the university setting, from the middle to the senior management level, should possess professional qualifications that could enable them to communicate and relate with academic and senior management staff of the university to be able to translate the strategic objectives of the university into the development, operation and maintenance of facilities for the pursuance of the core functions of teaching and research. Preferably, they should come from the Engineering and built environment professions and possess hard and soft skills in project management and law, with well-developed interpersonal skills (Ogebeifun, 2011).

The Relation of Facility Manger with Other Units of the Organization

Generally, the facility manager is responsible for the effective and efficient provision of facilities and services to support the University in achieving its primary objectives. This implies there are two facets of a facility manager's task. One is operational, and is the continuous provision of facilities and services here and now to support employees and the University as a whole. The other is strategic with an eye to the future, to anticipating and meeting future needs (Anna, 2005).

Operational FM focuses on:

- Preventing damage and maintaining buildings and installations in good condition and security
- Providing facilities and services to students
- Creating and maintaining a comfortable and efficient working environment. The facility manager's task is thus to ensure that all facilities and services, many of which are closely interrelated, are synchronized to maximize and optimize to benefit to employees and the company. His department is thus the contact point for all of these

facilities and services, and for reporting malfunctions. The facility manager operates horizontally and vertically within the organization.

Challenges that affect students' satisfaction on Building Facility Maintenance Practice

There are various problems and challenges facing facility management professionals that require a wide range of knowledge in various areas.

- Management structure of organization and staffing of facilities management department Usually facilities managers are rarely high up within organizational hierarchy's. They tend to be located at the second or third management level, hence many facilities mangers find it difficult to influence corporate decision making in any way. In only very few companies are facilities managers on the board and thus in a good position to fight for the inclusion of facilities issues in the strategic plan. Even when facilities mangers are at quite a high level, this does not necessarily indicate that they will have equal power or influence as other staff at the same level. This may be because as a non-core service facilities are considered as nonessential. The structure of the facilities department in relation to the organization is also a critical factor. Many facilities department have not really been planned and have therefore developed in a disorganized fashion (Barret and Baldry, 2003).

- Organization's Understanding of Facilities maintenance: According to Barret and Baldry (2003), facilities management as a profession is still relatively new; there is a certain amount of mistrust and misunderstanding of what it is about. Support of senior management is, therefore, an essential factor that can contribute to the influence that facilities management can have. Thus when facilities issues are properly understood by senior management, it is likely that facilities managers may become more involved in strategic planning. At present, upper level managers often take a short –term view of

property issues, for instance, maintenance budgets may be one of the first to be cut in times of hardship. These executives fail to see that small savings in the short term may lead to greater expenditure later.

- Facilities Mangers' Understanding of Organizations Objectives: In a similar vein, facilities managers do not always have a clear understanding of the core business and hence they are not active participants when important decisions are made. It is therefore essential that facilities managers take the time to learn what the core business is really about. Without this understanding, it is impossible for facilities departments to be more proactive. If facilities mangers are unable to take the initiative, senior managers may conclude that they are happy to remain in a reactive mode. Thus facilities managers should recognize the need to provide high quality, proactive and cost –effective services to maintain credibility with their client base (Barret and Baldry, 2003).

Even though facilities management exists to support the core business, it is often this relationship that runs into difficulties. As it is a support service, many facilities managers have taken on a reactive role, waiting for instructions before they perform any action. This often means that, dialogue will only occur when problems arise. The result is that the facilities manager has to remedy the situation quickly, rather than assessing what would be the best long term solution. It would be far better in some cases if the facilities manager has time to discuss the various implication. Such a lack of consultation is likely to result in a facilities management service that does not necessarily support the core business to the best of its capabilities (Barret and Baldry, 2003).

A typical example of this lack of communication would be an office move. Ideally in this situation the facilities team would consult with the users to find how each person worked and who they needed to be located next to. However, facilities groups are rarely given enough time

to do this and so the users are often moved into an impersonal office space that does not support their particular working patterns. Consequently, the whole department is likely to be demoralized and productivity may be reduced.

According to Barret and Baldry (2003), one of the ways to improve facilities services therefore is to become more proactive, i.e. actively seek out problems and requirements before they become critical.

- Facilities maintenance and External Influences: Facilities maintenance is a very wide field and consequently a continually changing one. New legislations and new techniques are appearing all the time and it would be virtually impossible for one person to keep track of all the different changes. Therefore, the facilities manager needs to employ certain methods to make this information processing task easier (Barret and Baldry, 2003).

Firstly, the facilities manager should utilize the expertise which already exists within the department. The facilities manger's role is that of coordinator, therefore, each of the functional units should ideally ensure that it is fully aware of developments within its own area of expertise and report any significant changes to the facilities manager. This should apply to both in-house personnel and contractors. The facilities manager will often have to take positive action to enable the functional units to acquire this knowledge. For example, facility management sends its maintenance technicians to regular courses to guarantee that they are fully of the latest techniques and legislation (Barret and Baldry, 2003).

Secondly, another way for the facilities manager to keep abreast of changes is to make use of existing contacts. Facilities managers have to deal constantly with many different specialists as part of their work, such as insurance firms, fire officers, building control, etc. Therefore, it makes sense to maintain good communications with these people so that they can advise on new developments in their areas.

Thirdly, facilities managers may also find it help full to make contact with other local businesses and exchange ideas.

2.8 Summary of Literature review

Facility management is an integrated approach to maintaining, improving and adapting the buildings in order to create an environment that strongly supports the primary objectives of the universities. The general goal of facility maintenance is to ensure the provision of attractive buildings, with properly functioning components and systems, that are properly operated, maintained and that provide surroundings and conditions conducive to quality instruction and learning.

In practice facilities management can cover a wide range of services including, facility planning, building operations and maintenance, building design and construction and general office services. However, there is no definitive guide as to what should be included. For example, considerably vary in their choice of functions, some concentrate primarily on maintenance whilst others include general office services. There are various ways to organize the facilities department. The size of the organization, location and services provided, should be taken into consideration when organizing a facilities department.

There are different possible relationships that could exist between facilities management and strategic planning in which, facilities management provides day-to-day operating support, facilities maintenance largely reacts to corporate strategic initiatives. There is also reciprocal and interdependent relationship between facilities maintenance and the corporate strategic planning process. Here facilities maintenance is viewed as credible and important. It is proactive and fully involved in helping guide the development of strategic plans.

The existence of specific organization or association that provides guidelines, support and control on the quality level is important in universities building facility maintenance practice.

Building maintenance policy is a written document, and provides a management framework to the maintenance personnel to determine appropriate maintenance strategy and standard. Building maintenance policy and strategy are one of the main aspects of management of building maintenance operation processes.

Detail record of buildings and facility history in the universities are important. A facility's history includes detailed information in the form of drawings, manuals, repairs, renovations, and alterations, accumulated in the process of developing and operating the facility.

Continuous survey of the building is crucial to get the information about the condition of the building's major systems and public areas: plumbing, electrical, heating, structural systems, roof and windows, etc. are necessary. The survey in form which repairs should be done immediately to eliminate hazardous conditions (like repairing bad electrical connections or faulty fixtures, or replacing broken windows) and which repairs can be postponed.

Generally, there are different types of building maintenance, planned and unplanned maintenance of the buildings. Planned preventive maintenance (PPM) is a schedule of actions aimed at avoiding breakdowns and failures. The objective of planned preventive maintenance is to prevent failure of equipment and components in service and to improve reliability by replacing worn parts. Tasks include inspections, equipment checks, diagnostics, adjustments and overhauls at specified intervals so if planned maintenance is absent this explained issues cannot do. Service personnel can record wear and other forms of deterioration so they know when to replace or repair worn parts in order to avoid failure. Periodic painting to protect building components and finishes is a common task within PPM.

Training is considered a vital element to the overall facility management program, especially for operation & maintenance staffs. When new equipment is installed or emerging technology is being employed, facilities personnel must be properly instructed and motivated. Training courses will familiarize personnel with the procedures necessary to operate and maintain

complex systems and equipment. Operation and maintenance manuals likewise conducive for use in training, can be required as both paper and as an 'on-line' interactive electronic manual (IEM) developed. Training should be ongoing to keep up with technology and equipment changes in the facility.

There are problems and challenges facing facility management professionals; lack of organized facility management and lack of professional associations, conferences, and short courses to get updated information about building facility management.

CHAPTER THREE

METHDOLOGY

3.1 Research Design

Kothari (2013) defines research design to be the arrangement for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. A research design constitutes the blue print for the collection, measurement and analysis of data. In this study, a descriptive survey is used as a tool to gain a greater understanding about individual or group perspectives relative to Students satisfaction on building facility maintenance in the Federal University of Technology Minna.

3.2 Area of Study

The study area Niger state is situated in the north central geopolitical zone of Nigeria with minna as its capital city. Other major cities in the state includes suleja, Bida and Kontagora. Established in 1976, Niger state was created out of the defunct North-Western states. It is the largest state in Nigeria with a vast land mass of 86,000km2 approximately 8.6 million hectares constituting about 9.3% of the total land area of the country. Lying on latitude 3.20º East and longitude 11.30º North, the states shares a country boarder with the republic of Benin (West) and state boarders within Nigeria. These include the Federal Capital Territory (FCT) on the South-East, Zamfara (North), Kebbi (North-West), Kwara (South-West) and kaduna (North-East). Located in Minna is the Federal University of Technology which has two Campuses respectively, the study will be conducted in the Federal University of Technology, Bosso Campus which includes the following areas;

i. Lecture Theatres
ii. Classrooms
iii. Hostels

3.3 Population of the Study

The research population comprises of 25,000 Undergraduate and 2,000 Postgraduate students of the Federal University of Technology Minna on both campuses, the population for the study is 233 students in Federal University of Technology Minna, Niger State; Male students 155, Female students 78.

3.4 Sample and Sampling Technique

A population is the set of people or collection of items under consideration in a research study (Collis & Hussey, 2017). The population for this study is quite large; therefore, sampling was used to select the respondents for the study. When conducting sampling, it is necessary to obtain data from only a portion of the total population with which the research study is concerned (Fellows & Liu, 2015). Only the size of each category within the sample is regulated but the selection of the sample is non-random and usually convenient (Leedy & Ormrod, 2017).

3.5 Instrument for data collection

Questionnaires were the instruments employed to attain required information from the respondents. They were required to tick correctly. A four-point rating scale was used to determine the level at which competencies is required. The questionnaires were divided into two main part A and B. Part A was constructed to obtain personal data from the respondent while part B will elicit information aimed at providing answers to the research questions considered for the study.

The instrument used for data collection was structure with four (4) points scale these are Highly Satisfy (HS) = 4, Moderately Satisfy (MS) = 3, Low Satisfy (LS) = 2, Not Satisfy (NS) = 1, Consisting of forty (40) items to investigate the hostel accommodation maintenance, classroom/lecture theatre maintenance, another four (4) points scale Strongly agree (SA) = 4,

Agree (A) =3, Disagree (D) =2 and Strongly Disagree (SD) =1. the strategies for improving maintenance of building facilities in Federal University of Technology, Minna.

3.6 Validation of the Instrument

To ensure validity of the instrument, the questionnaire was subjected to content validation. Three experts in the Department of Industrial and Technology Education, Federal University of Technology Minna assisted in the validation of instrument and their suggestion were incorporated to the final draft of the instrument with appropriate modification based on their suggestions, the final draft was made for the study.

3.7 Administration of the Instrument

The researcher administered the questionnaires personally. The direct administration enables the researcher to interact with the respondent and also enhance correct and quick completion and return of the instrument. A total of 247 copies of the questionnaire were distributed and 233 copies (88%) were duly returned after two weeks and used for analysis.

3.8 Method of Data Collection

The researcher administered the questionnaire to the respondents and the whole copies will be collected by the researcher on the same day after administering the questionnaire.

3.9 Method of Analysis

The data for this study was analyses using the mean, standard deviation and t-test as statistical tools to answer the research question and test the hypothesis formulated.

$X=\sum fx/n$

Where X= Mean

$\sum$= sum of nominal

F= frequently of response under each mode

X= Movement Value

Decision Rule

To determine the acceptance level, the item with mean response of 2.05 and above were considered as accepted while an item with a mean response of 2.49 and below were rejected. The acceptance level for the hypotheses testing is based on the degree of freedom which gives a t-table value at .05 level of confidence of 1.98. Therefore, any item with t-calculated value less than 1.98 was accepted while those equal or greater than 1.98 was rejected.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter deals with the presentation and analysis of data with respect to the research questions formulated for this study, the result of this data analysis for the research questions are presented first, followed by those of the hypotheses tested for the study.

4.1 Research Question One

To what extent does the students satisfy with hostel accommodation maintenance in Federal University of Technology, Minna?

Table 4.1.1: mean response on the extent to which students are satisfied with hostel accommodation maintenance in Federal University of Technology, Minna. N1=155 N2=78.

S/N	ITEM STATEMENT	X_1	X_2	X_t	Remark
1	Maintenance of walls structure in the Hostel	3.4	2.8	3.1	Satisfy
2	Maintenance of Electrical bulb in the Hostel	3.5	3.0	3.3	Satisfy
3	Maintenance of Electrical wiring in the Hostel	2.4	2.1	2.3	Not Satisfy
4	Maintenance of Floors in the Hostel	1.6	1.8	1.7	Not Satisfy
5	Prompt response to attend to faulty electrical fittings	1.4	1 9	1.7	Not Satisfy
6	Sensitization of students on important of good use of Hostel	2.3	2.2	2.3	Not Satisfy
7	Toilet maintenance	2 3	1.5	1.9	Not Satisfy
8	Maintenance of Fans in the Hostel	3.8	3.5	3.5	Satisfy
9	Maintenance of Roofing in the Hostel	3.8	3.5	3.8	Satisfy
10	Maintenance of Doors and windows in the Hostel	2.1	1.8	2.0	Not Satisfy
11	Maintenance of Staircase in the Hostel	3.4	2.8	3.1	Satisfy
12	Cleanliness in the Hostel	1.2	1.7	1.4	Not Satisfy
13	Maintenance of Ceiling in the Hostel	3.7	3.6	3.7	Satisfy
14	Maintenance of Lobby in the Hostel	3.5	3.6	3.6	Satisfy
15	Maintenance of Veranda in the Hostel	2.0	1.5	1.8	Not Satisfy

16	Maintenance of Water supply network system in the Hostel	1.8	1.6	1.4	Not Satisfy

KEY:

X1= average mean responses of male students,

X2= average mean responses of female students,

N1= number of male students,

N2= number of female students.

Table 4.1.1 reviews that the respondents are satisfied with item 1,2,8,9,11,13 and 14 with a mean score above 2.50 respectively. While item 3,4,5,6,7,10,11,15 and 16 are not satisfied with a mean score below 2.50. this means that item 1,2,8,9,11,13 and 14 are satisfied with the hostel accommodation maintenance in Federal University of Technology, Minna. While item 3,4,5,6,7,10,11,15 and 16 disagreed. Meaning that student's satisfaction level of building facilities maintenance with hostel accommodation is poor and inefficient

4.2 Research Question Two

To what extent does the students satisfy with classroom/lecture theatre maintenance in Federal University of Technology, Minna?

Table 4.1.2: mean response on the extent to which students are satisfied with classroom/lecture theatre maintenance in Federal University of Technology, Minna. N1=155 N2=78.

S/N	ITEM STATEMENT	X_1	X_2	X_t	Remark
1	Prompt response to attend to faulty electrical fittings in the classes/lecture theatre	1.7	1.8	1.8	Not Satisfy
2	Toilet maintenance	1.9	2.1	2.0	Satisfy
3	Maintenance of Fans in the classes/lecture theatre	3.1	2.9	3.0	Satisfy
4	Maintenance of Paint in the classes/lecture theatre	2.4	2.9	2.7	Satisfy
6	Maintenance of Roofing in the classes/lecture theatre	3.3	2.9	3.1	Satisfy
7	Maintenance of Doors and windows in the classes	3.8	3.0	3.4	Satisfy
8	Cleanliness in the classes/lecture theatre	3.2	3.8	3.5	Satisfy
9	Maintenance of Ceiling in the classes/lecture theatre	2.9	2.9	2.9	Satisfy

10	Maintenance of Walls structure in the classes/lecture theatre	3.3	2.8	3.1	Satisfy
11	Maintenance of Electrical bulb in the classes/lecture theatre	1.3	1.7	1.5	Not Satisfy
12	Maintenance of Electrical wiring in the classes/lecture theatre	2.3	1.8	2.1	Not Satisfy
13	Maintenance of Floors in the classes/lecture theatre	3.1	2.9	3.0	Satisfy
14	Sensitization of students on important of good use of classes/lecture theatre	1.6	1.9	1.8	Not Satisfy

KEY:

X1= average mean responses of male students,

X2= average mean responses of female students,

N1= number of male students,

N2= number of female students.

Table 4.1.2 reviews that the respondents are satisfied with item 2,3,4,5,6,7,8,9 and 12 with a mean score above 2.50 respectively. While item 1,10,11 and 13 were not satisfied with a mean score below 2.50. this means that item 2,3,4,5,6,7,8,9 and 12 are satisfied with classroom/lecture theatre maintenance in Federal University of Technology, Minna. While item 1,10,11 and 13 not satisfied.

4.3 Research Question Three

What are the strategies for improving maintenance of building facilities in Federal University of Technology, Minna?

Table 4.1.3: mean response on the strategies for improving maintenance of building facilities in Federal University of Technology, Minna. N1=155 N2=78.

S/N	ITEM STATEMENT	X_1	X_2	X_t	Remark
1	Regular checking and maintenance	3.3	2.8	3.1	Agreed
2	Have a policy on prioritizing the management needs of the building facilities maintenance	2.9	2.8	2.8	Agreed
3	students involvement in maintenance activities	3.8	3.0	3.4	Agreed
4	Sensitization of students and work department on the importance of maintenance	3.2	3.8	3.5	Agreed
5	Documentation of facility history	3.3	2.9	3.1	Agreed

6	Painting of the building	1.6	1.9	1.8	Disagreed
7	Preventive maintenance plan	2.4	2.9	3.0	Agreed
8	Careful planning and allocation of resources	3.1	2.9	3.0	Agreed
9	Effective communication between students and maintenance management team	1.9	2.1	2.0	Agreed

KEY:

X1= average mean responses of male students,

X2= average mean responses of female students,

N1= number of male students,

N2= number of female students.

Table 4.1.3 reviews that the respondents agreed with item 12,3,4,5,7,8 and 9 with a mean score above 2.50 respectively. While item 6 disagreed with a mean score below 2.50. this means that item 12,3,4,5,7,8 and 9 agreed to the strategies for improving maintenance of building facilities in federal university of technology, minna. While item 6 disagreed.

4.4 Hypotheses One

There is no significant difference between the mean response of the male and female students on the extent of maintenance management system adopted on building facility in Federal University of Technology Minna.

Table 4.2.1: t-test analysis of the respondents of the male and female students on the extent of maintenance management system adopted on building facility in Federal University of Technology Minna.

S/N	ITEM STATEMENT	SD_1	SD_2	t-test	Remark
1	Maintenance of walls structure in the Hostel	1.10	1.14	-0.52	A
2	Maintenance of Electrical bulb in the Hostel	0.75	0.94	1.30	A
3	Maintenance of Electrical wiring in the Hostel	0.44	0.93	-5.19	NA
4	Maintenance of Floors in the Hostel	0.58	0.64	1.70	NA
5	Prompt response to attend to faulty electrical fittings	0.38	0.82	1.69	NA
6	Sensitization of students on important of good use of Hostel	0.21	0.51	0.64	A
7	Toilet maintenance	0.50	0.67	-6.22	NA

8	Maintenance of Fans in the Hostel	0.49	0.30	0.84	A
9	Maintenance of Roofing in the Hostel	0.05	0.40	0.83	A
10	Maintenance of Doors and windows in the Hostel	0.62	0.80	-2.93	NA
11	Maintenance of Staircase in the Hostel	0.14	0.47	0.70	A
12	Cleanliness in the Hostel	1.05	0.87	2.63	NA
13	Maintenance of Ceiling in the Hostel	0.57	1.72	-1.28	A
14	Maintenance of Lobby in the Hostel	0.57	0.40	-0.66	A
15	Maintenance of Verandah in the Hostel	0.53	0.40	-0.68	A
16	Maintenance of Water supply network system in the Hostel	0.22	0.64	-2.46	NA

table 4.2.1: presents test of this hypotheses

Key

SD1= Standard deviation of male students
SD2= Standard deviation of female students
A= Accepted
NA= Not Accepted

The result shown in table 4.2.1 above indicates the Comparism between male and female students of the federal university of technology, minna. Data revealed that items 1,2,3,4,5,6,7,8,9,10,11,12,14 and 15 has a calculated t-value less than the t-critical value of ±1.98, hence hypothesis for these items were upheld at 0.05 level of significance. Except for item 13 and 16 which has a t-calculated value above the t-critical value ±1.98, thus HO was not accepted for this items.

4.5 Hypothesis Two

There is no significant difference between the mean response of the male and female students on the strategies for improving maintenance of building facilities in Federal University of Technology, Minna.

Table 4.2.2: t-test analysis of the respondents of the male and female students on the strategies for improving maintenance of building facilities in Federal University of Technology, Minna

S/N	ITEM STATEMENT	SD_1	SD_2	t-test	Remark
1	Regular checking and maintenance	0.46	0.30	-1.71	A
2	Have a policy on prioritizing the management needs of the building facilities maintenance	0.67	0.90	1.32	A
3	students involvement in maintenance activities	0.93	0.90	-0.56	A
4	Sensitization of students and work department on the importance of maintenance	0.88	0.40	1.08	A
5	Documentation of facility history	0.99	1.14	0.79	A
6	Painting of the building	1.10	0.69	-9.16	NA
7	Preventive maintenance plan	0.53	0.51	1.39	A
8	Careful planning and allocation of resources	0.72	0.52	0.00	A
9	Effective communication between students and maintenance management team	0.91	0.51	-3.30	NA

table 4.2.2: presents test of this hypotheses

Key

SD1= Standard deviation of male students
SD2= Standard deviation of female students
A= Accepted
NA= Not Accepted

The result shown in table 4.2.2 above indicates the Comparison between male and female students of the federal university of technology, minna. Data revealed that items 1,4,5,6,8 and 9 has a calculated t-value less than the t-critical value of ±1.98, hence hypothesis for these items were upheld at 0.05 level of significance. Except for item 2,3,7 and 10 which has a t-calculated value above the t-critical value ±1.98, thus HO was not accepted for this items.

4.6 Findings of the Study

The following are the principle findings of the study, they are organized based on the research questions and hypothesis.

The findings related to student's satisfaction with hostel accommodation maintenance in Federal University of Technology, Minna, Niger State.

1. There is lack of building operation and maintenance policy that are used in the practices of building facilities maintenance of hostel accommodation, professional experts in building facility maintenance, proper planning in facility management, training for building maintenance staffs, which indicates that student's satisfaction level of building facilities maintenance with hostel accommodation is poor and inefficient

The findings related to student's satisfaction with classroom/lecture theatre maintenance in Federal University of Technology, Minna, Niger state

1. Regular building condition survey, technologies like computerized maintenance system to simplify building facility management practice, specific organization or separate body that provides guidelines and preventive building maintenance type is being carried out in classrooms/lecture theatre compared to other building facilities
2. Sensitization of students on important of good use of classes/lecture theatre and Prompt response to attend to faulty electrical fittings in the classes/lecture theatre is by the maintenance are the problems yet to be adequately managed concerning student's satisfaction with classroom/lecture theatre maintenance in Federal University of Technology, Minna

The findings related to the strategies for improving maintenance of building facilities in Federal University of Technology, Minna, Niger State.

1. Regular checking and maintenance

2. Have a policy on prioritizing the management needs of the building facilities maintenance
3. student's involvement in maintenance activities
4. Sensitization of students and work department on the importance of maintenance
5. Documentation of facility history
6. Painting of the building
7. Preventive maintenance plan
8. Careful planning and allocation of resources

4.7 Discussion of the Findings

Findings of the study revealed that student's satisfaction level of building facilities maintenance with hostel accommodation in Federal University of Technology, Minna, Niger state is poor and inefficient. It also revealed that the satisfaction of building facilities maintenance on classroom/ lecture theatre is inadequate but average public tertiary institution. Building deterioration and obsolescence are inevitable and to be expected as part of the ageing process of a building (Mills, 1994; Douglas & Ransom, 2007). However, maintenance can help reduce the speed of deterioration and failure (Douglas, 2006; Douglas & Ransom, 2007; Mills, 1994; Seeley, 1987). Unfortunately, available evidence suggests that buildings are generally under-maintained, particularly due to the general lack of concern for building maintenance (Chanter & Swallow, 2007; Lee 1987; Lee & Wordsworth, 2001). Despite the lack of concern and the negative perceptions, the importance of building maintenance cannot be ignored. Arazi et al. (2009) were of the view that building maintenance helps to minimise decay, defect, deterioration and failure to ensure that buildings perform optimally during their life cycle and represent value to the users. The asset value of a building actually decreases unless maintenance is carried out (Lee & Wordsworth, 2001; Wood, 2009; Olanrewaju et al., 2011a). Additionally, maintenance helps in improving the performance of building systems, reducing operating cost, improving user satisfaction, ensuring compliance with statutory obligation and enhancing

community perception (Queensland Department of Public Works, 2010). Maintenance is also carried out to ensure that the buildings and their associated services are in a safe condition, that the buildings are fit for use, that the condition of the building meets all statutory requirements, and to preserve the appearance of the building, to maintain the quality of the building and to maintain the value of the physical assets of the building stock (Alner & Fellows, 2014; Seeley, 2017). The findings show that student's satisfaction level of building facilities maintenance is grossly low and maintenance unit is underfunded. Apart from these advantages, effective maintenance can help to reduce future resource requirements by prolonging a building's life or by strengthening its disposal value (Department of Treasury and Finance, 2015). The objective of building maintenance is to ensure that buildings are preserved in a satisfactorily functional condition, with consideration giving to safety and economy (Sowden, 2014). Miles and Syagga (2014) postulated that the functional role is to retain the usefulness and the appearance of the building facility. Essentially, building maintenance is carried out in order to allow buildings to continue to perform their functions effectively and efficiently (Lee & Scott, 20016a; 20016b; Wood, 2016).

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

The essence of this study was to assess student's satisfaction level of building facility maintenance in federal university of technology minna, Niger state. Three research questions guided the study

1. To what extent does the students satisfy with hostel accommodation maintenance in Federal University of Technology, Minna?
2. To what extent does the students satisfy with classroom/lecture theatre maintenance in Federal University of Technology, Minna?
3. What are the strategies for improving maintenance of building facilities in Federal University of Technology, Minna?

Based on the data collected and analyzed for these research questions, the following findings were made;

1. Students are not satisfied with hostel accommodation maintenance in Federal University of Technology Minna
2. Students are not satisfied with classroom/lecture theatre maintenance in Federal University of Technology Minna
3. The strategies for improving maintenance of building facilities in FUT Minna is somewhat encouraging though it can be better.

5.2 Implication of the study

The finding of this study is of immense benefits to public and private tertiary institutions, and students, personnel of the indigenous Project Planning Department (PPD) in Federal University

of Technology, Minna, Niger, Federal government and the overall education system. The findings of this study is a self-appraisal of student's satisfaction level of building facilities maintenance, that there is the need to map out an effective internal evaluation system in order to build a feedback mechanism by which the state of facilities and their performance can be monitored periodically. The findings of this study reveals that Universities frequently face constraints of resources; therefore, it is crucial to decide how these scarce resources will be best deployed by the Federal Government to achieve the highest level of students' satisfaction. The findings of this study further revealed the need for a computerized maintenance management system as a tool that is gaining ground and promoting effective maintenance management, therefore, Training courses will familiarize personnel with the procedures necessary to operate and maintain complex systems and equipment.

5.3 Contribution to Knowledge

One significant factor that affects students' satisfaction level is the frequency of maintenance;

1. Regular maintenance of buildings including classrooms, libraries, hostels, and laboratories, creates a clean, safe and comfortable learning environment.
2. High quality maintenance work ensures that the buildings systems, such as lighting, ventilation, air conditioning, and plumbing function efficiently.
3. The cost of maintenance can also influence students' satisfaction level, Universities that allocate adequate funds for building facility maintenance demonstrate their commitment to providing a comfortable learning environment.

5.4 Conclusion

In conclusion, the study has been able to achieve to a reasonable extent, Lack of proper planning, building operation and maintenance policy, detail record of the building, specific organization or association, regular training for building management staffs and facility maintenance experts have an effect on building facility management. Breakdown building maintenance type is the most frequently practice in the studied university

More importantly, this study was aimed at examining the challenges of maintenance of facilities at public universities. Related studies and mixed research methods were used to collect data for the paper. Results of the study reveal that the maintenance of facilities at most of the public universities indeed continues to face challenges. Firstly, most of the facilities at the majority of public universities were in poor condition and overcrowded. Secondly, it was also found that most of the public universities had limited skilled and incapable facility maintenance departments, and thirdly, the majority of institutions lacked financial resources to adequately manage their facilities. These problems have had a detrimental effect on the quality of learning and the teaching environment at some public universities, with the institutions failing to fully achieve their intended objectives of eradicating poverty, social disorganization, low production, unemployment, hunger, illiteracy, diseases and underdevelopment on the African continent. The prioritization of funding for quality facilities at public universities by governments, employment of well qualified and trained staff in facility departments at public universities, and the creation of innovative and smarter public private partnerships aimed at improving facilities and providing new ones at public universities were identified as the key solutions to solving the challenges that public universities are facing in connection with the quality of their facilities. Findings will support public universities, their governments and other higher education partners in their efforts to improve existing facilities and provide new ones, in order to support the survival of the institutions.

5.5 Recommendation

Based on the findings of this study and conclusion drawn, the following recommendation were made;

1. That there is the need to map out an effective internal evaluation system in order to build a feedback mechanism by which the state of facilities and their performance can be monitored periodically. This system would aid the technicians'/ management executives of the works department in having a right perception as to the satisfaction students derive from usage of these facilities.
2. Private developers should be engaged in a partnership scheme with the school management to construct more buildings on campus with current state of the art facilities which will meet the needs of the growing population of the students.
3. A computerized maintenance management system is one of the tools that is gaining ground and promoting effective maintenance management. However, the research revealed that the maintenance department does not currently have a computerized maintenance management system in place; it is highly recommended that the institution help the maintenance department to purchase one as that will help with the planning, strategies, documentation and monitoring of maintenance.

5.6 Suggestion for Further Studies

1. A study should be carried out to determine the extent to which Facility maintenance in public universities is been funded for effective implementation by the institution
2. A study should be carried out to analyze the extent to which students are involved in the maintenance management process

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APPENDIX I

REQUEST LETTER TO VALIDATORS

Industrial and Technology Education
Department
Federal University of Technology,
P.M.B. 65,
Minna,
1st February, 2023.

Dear Sir,

REQUEST FOR FACE VALIDATION OF INSTRUMENT FOR STUDENTS SATISFACTION LEVEL OF BUILDING FACILITIES MAINTENANCE IN FEDERAL UNIVERSITY OF TECHNOLOGY MINNA.

I am an undergraduate student of the above named address currently undertaking a study on the topic: STUDENTS SATISFACTION LEVEL OF BUILDING FACILITIES MAINTENANCE IN FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE, NIGERIA.

Attached is the draft copy of the instrument. As an expert in this area, your assistance is hereby solicited to enable me accomplish this task. Kindly go through the item to verify their clarity, relevance and appropriateness in the use of language. In addition to this you can also make further suggestions that will improve the status and quality of the instrument. Your contribution to this work is highly appreciated.

Thanks

Yours faithfully,

SAMUEL JOHNSON
2016/1/63738TI

APPENDIX II

Department of Industrial and Technology Education,
Federal University of Technology,
P.M.B. 65,
Minna,
1st February, 2023.

Dear Respondent,

REQUEST FOR RESPONSE TO QUESTIONNAIRE

I am a final year student of the above mentioned institution, undertaking a study titled: "**Students Satisfaction Level of Building Facilities Maintenance in Federal University of Technology Minna, Niger State, Nigeria".** Your objective responses are highly needed in ascertaining the facts under investigation. Please feel free and open to share your mind objectively, for your responses have great impact on the findings. All collected responses will be used only for this research and treated confidentially.

Thank you

Yours faithfully

SAMUEL JOHNSON
2016/1/63738TI

APPENDIX III

QUESTIONNAIRE: On Students Satisfaction Level of Building Facilities Maintenance in Federal University of Technology Minna, Niger State.

PART A

INTRODUCTION: Please complete this questionnaire objectively and sincerely by ticking the column that represent your opinion or perception about the above topic

Personal Data

Name of Department -

_____

Male Student ☐

Female Student ☐

A four (4) point rating scale is used to indicate your opinion as below:

Highly Satisfy (HS) – 4	Strongly agree (SA) -4
Satisfy (S) – 3	Agree (A) -3
Fairly Satisfy (FS) -2	Disagree (D) -2
Not Satisfy (NS) -1	Strong Disagree (SD) -1

PART B

Research Question I

To what extent does the students satisfy with hostel accommodation maintenance in Federal University of Technology, Minna?

S/N		HS	S	FS	NS
1	Maintenance of Walls structure in the Hostel				
2	Maintenance of Electrical bulb in the Hostel				
3	Maintenance of Electrical wiring in the Hostel				
4	Maintenance of Floors in the Hostel				
5	Prompt response to attend to faulty electrical fittings				
6	Sensitization of students on important of good use of Hostel				
7	Toilet maintenance				
8	Maintenance of Fans in the Hostel				
9	Maintenance of Roofing in the Hostel				
10	Maintenance of Doors and windows in the Hostel				
11	Maintenance of Staircase in the Hostel				
12	Cleanliness in the Hostel				
13	Maintenance of Ceiling in the Hostel				
14	Maintenance of Lobby in the Hostel				
15	Maintenance of Verandah in the Hostel				
16	Maintenance of Water supply network system in the Hostel				

Research Question II

To what extent does the students satisfy with classroom/lecture theatre maintenance in Federal University of Technology, Minna?

S/N		HS	S	FS	NS
1	Prompt response to attend to faulty electrical fittings in the classes/lecture theatre				
2	Maintenance of Toilet maintenance				
3	Maintenance of Fans in the classes/lecture theatre				
4	Maintenance of Paint in the classes/lecture theatre				
5	Maintenance of Roofing in the classes/lecture theatre				
7	Maintenance of Doors and windows in the classes				
8	Cleanliness in the classes/lecture theatre				
9	Maintenance of Ceiling in the classes/lecture theatre				
10	Maintenance of Walls structure in the classes/lecture theatre				
11	Maintenance of Electrical bulb in the classes/lecture theatre				
12	Maintenance of Electrical wiring in the classes/lecture theatre				
13	Maintenance of Floors in the classes/lecture theatre				
14	Sensitization of students on important of good use of classes/lecture theatre				

Research Question III

What are the strategies for improving maintenance of building facilities in Federal University of Technology, Minna?

S/N		SA	A	D	SD
1	Regular checking and maintenance				
2	Have a policy on prioritizing the management needs of the building facilities maintenance				
3	students involvement in maintenance activities				
4	Maintenance drawing				
5	Documentation of facility history				
7	Painting of the building				
8	Preventive maintenance plan				
9	Careful planning and allocation of resources				