



# The Use of Architectural Components in Minimizing Maintenance of Buildings for Benue State, Otukpo.

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## Abstract

Buildings are designed with the intention of lasting a long amount of time. Building maintenance is characterized in various building typologies as multifaceted tasks that include planning, managing, regulating, and coordinating resources to maintain the physical, functional, and organizational efficiency of the building. The study focused on how minimizing maintenance was achieved, successfully, with the use of architectural components. Data from educational institutions' maintenance departments is collected and evaluated. According to the findings of the report, building maintenance culture can be either positive or negative depending on the nature of the construction technique used. The study advises that organisations planning to erect building structures conduct a thorough analysis of building codes and legislation in order for builders to adhere to established requirements and minimize maintenance. The research finally instructed the social control of maintenance integration in design necessities in youth development centers and planning authorities, it also proved that correct maintenance considerations throughout the design stage can save the building from failing, it also shows the extent to which maintenance options may be integrated into youth development center buildings in Benue state's Otukpo local government district.

**Keywords:** *maintenance, building typologies, organizational efficiency, multifaceted tasks*

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## INTRODUCTION

The planner, as the leader of the construction team, has a major influence on the cost of constructing projects. From the moment the architect starts conceptualizing designs for every building construction by architecture, one begins to influence the life cycle in terms of expense of the building construction. It is beyond time for architects and other allied experts to pay careful attention to the new buildings' maintenance requirements. The architect will maintain the worth of the investments made in a construction project by making choices at the design stage. As a result, the concept stage is critical. Every line in the design and every instruction the architect issues would determine the building performance. The emergence of the topic of cost in almost every construction work is one that is seldom far from the minds of the clients, the designer and construction team (Hughes, Champion & Murdoch, 2015).

Building maintenance is the most economical way of keeping the building and equipment in their best form for normal use. To preserve the building design, to retain the construction and all other building components, the Architect needs to put in mind the maintenance type. Maintenance upgrades the

efficiency of a building construction to fulfill current standards in order to increase the life of the building. It is needed to ensure the safety of building occupants. Shohet and Straub (2013) reported that there are growing pressures on maintenance programs to provide resources to help in maintenance preparation. This is also supported by Olagunju (2012), who noted that the lack of adequate resources for predictive management of existing buildings can have a negative impact on their future. It is important to conduct maintenance work in order to ensure the protection of people and property in the buildings, as well as to protect the physical condition of the buildings and maintain them in good operational condition at all times. Appropriate building repairs can be done by making maintenance equipment available to all public buildings (Izobo-Martins, 2014).

Furthermore, Izobo-Martins et al. (2014) stressed that not all building styles in all locations need maintenance. Regardless of the cost of renovation, all structures would need repairs at some point. Buildings need proper upkeep as they age, despite the fact that the cost of goods and labor will still increase in tandem with inflation and the standard of living. In certain cases, building owners and consumers waste billions of dollars per year on unnecessary repairs and product repair in their houses. Maintenance criteria attract less consideration. Many building owners, both private and public, would rather see buildings deteriorate to the point that rehabilitation is impossible and expensive (Assaf, et.al, 2011). Building maintenance is a major issue that building owners and tenants fail to address. Our world is made up of a lot of physical infrastructure investments, and as a result, it evolves over time. These adjustments may occur in terms of technologies or physical structure. It is also critical that these infrastructure services, which include municipal buildings, be effectively managed in order for these facilities to have optimum architectural and functional value.

## **RESEARCH METHODOLOGY**

The thesis employed an analytic cross-sectional sample design. The research was carried out in the Makurdi local government region of Benue province, Nigeria. The study included a total of 4424 people, including 1107 residents of government residential estates, 2863 residents of privately owned residences, and 454 building professionals, including 120 builders from the Nigeria Institute of Builders (NIOB) Makurdi Branch, 294 engineers from the Nigerian Society Engineers (NSE) Makurdi Branch, and 40 architects.

## **DEFINITION OF MAINTENANCE**

According to BS 38113, 'maintenance' is "work done to keep or repair a facility, i.e. any aspect of a site, house, and contents, to an appropriate standard." The British Standard goes on to say that if there are formal maintenance standards, the 'appropriate standard' must be no less than that required to satisfy them, and 'maintained' is specified in the Factories Act 'maintained in an effective condition, in efficient operating order, and in good repair,' according to 1961. BS 3811 was written by a committee mainly concerned with mechanical engineering, which has restricted the standard's applicability and utility to building maintenance. Furthermore, since the regulatory provisions are largely concerned with health and safety, they offer no guidance on maintenance practices.

The Committee on Building Maintenance describes an "acceptable standard" as "one that maintains the utility and integrity of the facility," and this is found to require a degree of change over the existence of a building as acceptable comfort and amenity levels increase. Cleaning would also be used in building care operations. BS 3811 categorizes maintenance as 'expected' or 'unplanned,' with the former further subdivided into 'preventive' and 'corrective' maintenance. Planned corrective maintenance is work done to deter a facility from failing and is done during the facility's planned existence to ensure its continued service. Corrective repair is work done to return a service to normal service or to an appropriate level.

Unplanned repair is work that occurs as a consequence of accidental breakdowns or disruption caused by external factors. Maintenance practice is often classified as 'predictable' and 'avoidable.' Predictable servicing is routine annual work that may be needed to maintain a product's performance characteristics, as well as work required to replace or restore the product after it has reached the end of its usable life cycle. The work done to fix faults caused by improper design, incorrect installation, or the use of defective materials is referred to as voidable maintenance.

Building repair is distinguished not only by the variety of tasks involved, but also by the interests involved. The primary goal should be to get decent value for the money expended on upkeep, but there are differing opinions on this—national vs. private; long vs. short term; and landlord vs. tenant.

## **CONCEPT OF BUILDING MAINTENANCE**

It is highly beneficial but difficult to create maintenance-free structures, though more can be achieved during the design stage to minimize the amount of eventual maintenance work. Building components deteriorate at varying rates depending on the materials and techniques of construction, environmental factors, and the operation of the building.

## **REVIEW OF DESIGN FACTORS RESPONSIBLE FOR DETERRING SUSTAINABILITY AND CAUSING MAINTENANCE**

### **DESIGN PHASE**

This section of the paper is in charge of identifying errors created or revealed by the efforts of construction personnel. The building architecture discipline includes the practices of several different fields, ranging from architect to public works engineer to interior designers. As a consequence, it is added that the design process is the root of both positive and poor performance. Recognizing the significance of this hub, Atkinson (1998) states that the majority of building flaws are the product of structural mistakes and omissions or carelessness. The availability of the correct and suitable material is crucial to remember at the design period in order to prevent post-occupational maintenance. However, minimal material options often left designers with no alternative but to recommend a material that had already been proved to be poor (Addleson1996). According to Addleson (1996), this condition happens when a designer intentionally uses the incorrect or improper material when he or she does not have an alternative material to use and the effects are well predicted at an early stage of design. Thus, it is possible to note that conditions such as non-availability or a lack of content substitutes are also among the causes of the defective design.

## **CONSTRUCTION AND MANAGEMENT**

Ambrose's (1992) study demonstrates the significance of architecture and management considerations in building design. According to Ambrose's brief, understanding construction management is needed for intelligent design work. In terms of alternative materials, Ambrose notes that such specifics are not possible to obtain with a specific substance or method. The research emphasizes the importance of designers accepting the reality and including some alternatives for completing the design.

According to Peacock (1986), the following factors contribute to designers' inability to reduce maintenance:

- (a) Unsatisfactory detailing,

- (b) Incorrect collection of construction materials, parts, and structures,
- (c) Lack of standardization, and
- (d) Failure to understand how the structure is used and maintained.

According to Peacock's analysis, these causes are responsible for expensive unplanned repairs in houses. However, planners should be advised that if they change their construction plans in terms of these considerations, they would be able to reduce building upkeep and its high costs. Gilder (1989) considers poor detailing to be a source of many faults in a structure, as well as poor detailing that makes incorrect assembly on site or in the warehouse impractical to deem it a workmanship flaw. The Gilder research emphasizes the importance of understanding the construction process, which is the second most critical after the design phase, in achieving successful building design. This process contains a variety of aspects that are related to repair. In reality, this phase's workmanship and detail drawings are intertwined. However, flaws resulting from a lack of detail sketches are often misidentified as flaws caused by workmanship.

## **THE USE OF ARCHITECTURAL COMPONENTS IN MINIMIZING MAINTENANCE IN BUILDINGS**

This research will be focused on architectural design elements, mainly on spatial organization, aesthetics, building form, building elements, site planning and landscaping, structural and construction system as well as to come up with a good design which incorporates maintenance factors. The survey research will focus on Student Centre Complex using questionnaire, interview schedule and case studies of existing Students Centre Complexes locally. The study will attempt to incorporate other facilities in the proposed Student Centre Complex which would enhance attraction, utilization and as well meet the spatial, and functional requirements of its users

## **CONCLUSIONS AND SUGGESTIONS**

Although contemplating aesthetics, the architect should not overlook the financial implications of his work. A beautiful architecture does not have to be expensive, so the architect can try to design a simple but not simplistic envelope, particularly if the building is not monumental, such as a museum. When the considerations listed in the analysis are taken into account during the design phase, the building's maintenance costs will be reduced. Any maintenance issues can be eliminated by improving the construction, detailing, and specification writing of building materials, but this must be achieved with careful consideration of environmental conditions.

The following recommendations were made based on the study's findings:

1. Rather than waiting for corrective repairs, public occupants should prioritize proactive maintenance practices.
2. A National Maintenance Policy should be developed as part of the National Housing Policy to force individuals to do maintenance on the buildings they rent in order to prevent a condition in which large amounts of taxpayers' money are wasted due to the decay of public buildings due to a lack of maintenance.
3. Building plans and configurations can use components that need the least amount of maintenance; for example, tiling the exterior walls of high-rise buildings eliminates the need for painting due to the building's height.

4. Individuals should embrace maintenance as a practice and government should engineer action towards more advocacy, policy and awareness on the essence of maintenance as a practice for national sustainability

## References

Oluwatoyin, Izobo-Martins & Ekhaese, Eghosa & Ayo-Vaughan, Emmanuel. (2018). Architects' View on Design Consideration that Can Reduce Maintenance Cost. Mediterranean Journal of Social Sciences.

Momngu Daniel Tiough, Terhemmen Thomas Hwande (2018) Assessment of building maintenance practices on residential buildings in Makurdi local government area, Benue state

Sharmin Khan, (2012) Designing Buildings for Minimum Maintenance to Achieve Sustainability, Architecture Research

Abdul Aziz Abas(2014) Building maintenance Civil & Structural Engineers Approach

A.I. Che-Ani (2010) Sustainability in building maintenance: the design responsibility

I. H. Seeley (1976) The Nature and Importance of Building Maintenance

Othuman Mydin, Md Azree. (2016). SIGNIFICANCE OF BUILDING MAINTENANCE MANAGEMENT SYSTEM TOWARDS SUSTAINABLE DEVELOPMENT: A REVIEW. Journal of Engineering Studies and Research. 21. 10.29081/jesr.v21i1.41.

