BUILDING MAINTAINIBILITY: CAUSES OF OBSOLESCENCE AND ITS POSSIBLE SOLUTION IN NIGERIA BUILDINGS

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ABSTRACT

Obsolescence according to oxford learner dictionary is defined as a state of becoming old fashioned, or no longer useful. Obsolescence has caused so many defaced building to be demolished or when it occurs, the aim of maintenance on building increases in order to enlongate its lifespan and prevents it from being defaced. If the root of obsolescence is being tackled by identifying the causes and proffering the right solution to it, the cost of maintenance will be reduced because the lifecycle of a building will be completed in it physical, economical and functional state. Minimizing obsolescence and extending longevity are therefore indispensable for maintaining the physical, economic and societal investments. The characteristics and symptoms of obsolescence are explored specifically to address how buildings can be diagnosed and when and to what extent is demolition an unavoidable consequence. This study therefore adopts a careful review of the root causes of obsolescence on our Nigerian buildings and how to reduce it occurrences. If the word obsolescence becomes obsolete, the demolition and replacement of building as a result of the structure being out dated or defaced will be a mirage.

Keywords: Obsolescence, Maintenance, Lifecycle, Building, Symptoms

INTRODUCTION

Obsolescence is commonly regarded as the beginning of the end-of-life phase of buildings. Sources about the life cycle of buildings show a variety of terms. The building and development trade commonly refers to the development cycle,

consisting of the development phase, including the design and the construction phase, and the usage phase, consisting of the actual use and the reuse or end-of-life phase (de Jonge and Arkesteijn, 2008). Sources regarding the life span, building pathology and mortality of buildings more often refer to the physical life or real life, being the period of physical existence, including the usage and end-of-life phase. This is in line with most national building stock statistics that in general only state withdrawal from the residential stock, in some countries subdivided by withdrawal by demolition and/or disaster, merging with other buildings and loss of function (Dol and Haffner, 2010. Obsolescence is commonly regarded as the beginning of the end-of-life phase of buildings.

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It is widely known that maintenance culture has being a challenge to most facilities in the Nigerian system. Building designs have taken a new dimension with insignificant percent of them not adhering to the principles that allow for easy access for maintenance or other considerations that can help sustain or elongate the service life of such structure. This most times easily allows obsolescence to set in prior to their service life.

Cowan and Bryon (2005), explains that obsolescence is a significant decline in the competitiveness usefulness or value or value of an article. This simply means that Obsolete building cannot stand tall in the midst of upcoming buildings. It occurs generally due to change or due to changes in user preference requirements or styles. it is distinct from fall in value (depreciate) due to physical deterioration or normal and wear and tear. According to Andre (2014) minimizing obsolescence is indispensible for the up keeping of the physical, economical and societal investments involved. In other words, an obsolete building which is seen as a building that is face-out, dilapidated, out-dated or no longer in use, if not addressed will cause a resultant defaced not only to our building but also to our built environment and in turn causing an ill to our livelihood.

Teylor,(2011) clearly vet that demolition is a necessary end to an obsolete building. This is to say that a building that is under obsolescence is supposed to have served its purpose completely and it due for evacuation. The necessary end of an obsolete building should not be demolition Thomsen and van der Flier, (2009).

It is clearly noticed that with exception of the monumental and iconic buildings, (building that tends to depict or connote a thing) in the nation, high percentage of the building around the country, especially the southern and eastern part of the nation

imbibe high and sophisticated design that does not stand the taste of time and thus becomes face-out and most times are demolished for new buildings that has recent characteristics and element. Building that can survive their service life is expedient to keep simplicity and ease of use as a conceptual philosophy. Fashion and style are two words that can be used to illustrate this; fashion fades away with time while style can stand beyond the limit with fashion could stand. Therefore a building that imbibe fashion based element (elements that are invoke but are not sustainable) will of a certain fade away with time thus bring near and to an end the lifecycle of the building.

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The end phase of a building elongated can be if there was a careful consideration from the design stage. A key factor that causes obsolescence is a shift in technology or product design. When new components come to market, older parts become less useful and are usually designed out of a product or the manufacturing process. Likewise, rapidly changing technology in equipment also causes obsolescence.

This subject matter has being looked at by several authors, and possible solutions have being proffered in their different views. In this research, therefore obsolescence will be looked at in different view but will be done through the categories that it comes.
Obsolescence is made visible in part them gradually spread into the whole. Therefore a careful analysis of the part, which it comes, will eventually give mitigation to this ever trending issue.

(Wassenberg, van Meer, and van Kempen, 2007). Assert that apart from physical decay, obsolescence is more and more related to exogenous factors on a larger scale like unattractiveness of the neighborhoods and/or the availability of more attractive alternative options. Nutt et.al. paid in their then breaking analytic models for housing obsolescence much attention to the allocation and movement of residents

OBSOLESCENCE CAN BE VISIBLE THROUGH THE CATEGORIES

Functional Obsolescence

Functional obsolescence, a term commonly used in real estate, is a reduction of an object's usefulness or desirability because of an outdated design feature that cannot be easily changed. The application of the term varies per industry. For example, in real estate, it refers to the loss of property value due to an obsolete design feature, such as an old house with 1 bathroom in a neighborhood filled with new homes featuring at least 3 bathrooms. Items become functionally obsolete when they can no longer adequately perform the function for which they were created. This most time occurs because user need changes with time thus building functions if not flexible in use will definitely not fit the future trend by users. For example, he suggested that hotel's obsolescence would occur faster than banks due to their ever-changing functions and tastes. Wikipedia, (2019). It is known that the operations/function in the banks are some sought fixed so and architectural style for a bank have a longer service life that that of the hotel which uses tend to change with trend and time.

Architectural obsolescence

The term "obsolescence" was first applied to the built environment in 1910 in an attempt to explain American skyscrapers' sudden loss of value. New York engineer Reginald P. Bolton attributed this phenomenon to "something new and better out-competing the old" and calculated the average architectural lifespan of varying building types in order to formulate a rough estimate for their impending obsolescence.

Style Obsolescence

Architectural styles that are not historic tend to go obsolete easily as it cannot be related to any thought of study over time. Historic

structures that are iconic does not easily go out of date because it depicts a field of study or it conveys an idea, which will always serve as a remembrance to certain memory.
When a product is no longer desirable because it has gone out of the popular fashion, its style is obsolete. If a style goes obsolete it means it no longer in the trend of things.
Because of the "fashion cycle", stylistically obsolete products may eventually regain popularity and cease to be obsolete.

Components Obsolescence

Buildings are made with varying components and each of these components comes with their service life. As earlier said obsolescence does not show up suddenly in a whole, it begins from part and gradually spread into the whole. Therefore the several component should be thoroughly examined and their service life known.

SOURCES OF OBSOLESCENCE

Academic surveyors and building economists often make the point that, over time, a building can become less suited to its purposes for a variety of reasons and that this indicates that there are various *types* of obsolescence By contrast, our argument is that, fundamentally, all obsolescence is 'functional obsolescence'. However, it is true that this dysfunction may have a variety of *origins*. In other words, a building's inadequacies can stem from more than one source. Obsolescence is crucially concerned with the relationship between location, form and condition on the one hand and functions on the other.

Obsolescence manifests itself as a mismatch between location/ form/ condition on the one hand and [*function*] on the other. The notion of *obsolescence* brings to the fore the following question: 'Is this building in this place, in this form, in this condition, suited to our current needs and future plans?' In other words, the notion of obsolescence focuses attention on a building's *use value*. Included in the notion of a building's 'form' is it size, material make-up, external style and design, and internal layout. 'Condition' includes those factors that establish a building's basic integrity (make it safe, sound and aesthetically pleasing) and those factors that contribute to its technical

efficiency (e.g. affecting heat and noise transference). The building's decorative state is also included as an aspect of its 'condition'. Together, form and condition define a building's physical and material nature (what it is). A building's location defines a building's position in geographical space (where it is). A building's use value will be affected by both what it is and where it is.

Building Form

The form that a building design assumes can greatly cause a distaste of such structure over time. Certain forms does not depict acceptance by the environment/surrounding over a certain time. In addition, certain building form does not allow for accessibility for maintenance therefore can cause obsolescence to occur in those area where maintenance access is restrained.

Location of Building

The environment, which a building is situated, can be a highly limiting factor if not carefully analyzed before construction commence. In fact if this not considered abandonment of such project and can never be finished therefore obsolescence can occur at the construction stage which in turn will not even allow the building the commence its service more less of completing the service life. A fully equipped and functional building that is wrongly site can lead to functional obsolescence as user will not able to have full access to the structure and this can lead to obsolescence.

OBSOLESCENCE MITIGATION STRATEGIES

The solution to obsolescence has being looked at by several authors but it still prevails. Therefore mitigating the subject matter is the suggested of handling it sustainably. The strategies towards reducing the effect are highlighted below but are subjected to further research.

- The Conceptual Design Stage.

The conceptual stage of a thing can be corrected easily. At the Design stage of every Design it is expedient that the factors of maintenance is are put in place. Design should be conceived such that it can complete it life cycle without much effort of

maintenance though cannot be neglected. Designs should be conceptualized not just base on the trend things but with sustainability in mind.

The types of design that should be imbibed should be such that it can be competitive with future structures with little or no touch. The design should be such that during it periodic maintenance can still stand out with other buildings.

Extreme aesthetical component that are not iconic should be minimized

- Flexibility of Use.

Building are design for user(human) majorly. In addition, it actualized in the environment that is prone to daily change. Interior spaces of building should designed such that it can allow for easy and interchanged usage by users as their activities will tend to change from time to time

Therefore building rigidity in design should be carefully reconsidered in this present time. Human activities change daily as every human. Each space allocated should designed such that changes can occur and still keep the building in it functional need. *Unconstrained Interior Space.* Constraints on interior space expansion may be imposed by structural or service (e.g., mechanical, electrical, and/or telecommunications) subsystems or by site characteristics. Provision of large, column-free areas gives maximum flexibility in moving partitions, and 24-to 30-foot column spacings continue to provide such areas without excessive increases in structural costs.

- Adapting For Reuse

When the "fit" between facility and user deteriorates, changing the facility's use often is a reasonable strategy for dealing with this type of obsolescence. This "adaptive reuse" of obsolete structures has become increasingly popular in the United States, particularly where facilities have some historic value.

- Separable Building Components

As earlier said, obsolescence does not occur immediately in the whole it. It begin in parts and certain building component before it spread into the other component and then spread to the whole. Therefore, after each component service life has being carefully examined and known should be design such that maintenance can be carried out on each of them where need be

without altering the other.(i.e if service life are not concurrent with the others)

- The Construction Stage

This is the stage where everything can go wrong if not properly executed. At the construction stage, contractor should adhere to specification given, ensure that every component is installed in quality professionally, and try as much as possible to be void of construction errors as this can cause issues that can give way obsolescence to occur. Defaced, cracked, and linking roofs in a building can shorten the service life of building components thus leading to the unavoidable end of the obsolete building (Demolition).

- Maintenance

This is is seen as a life cycle sustainer. According to (Boussabaine and Kirkham,2004). Maintenance is required to maintain a building's initial performance capacity. Without maintenance the performance will not meet the demand and eventually drop below the limit of acceptance of users or residents and the expected service life will not be reached, resulting in serious loss of efficacy.

In practice, both the demand and the limit of acceptance will gradually rise over time as a result of improved technology, rising standards and growing prosperity. Improvement and renewal are required to answer the accordingly rising expectations. By adding performance capacity the period of highest efficacy can be considerably extended and the service life prolonged. Assessment of the loss and benefits of alternative interventions in this way is part of nowadays-professional property and facility management.
See obsolescence and service life cure.

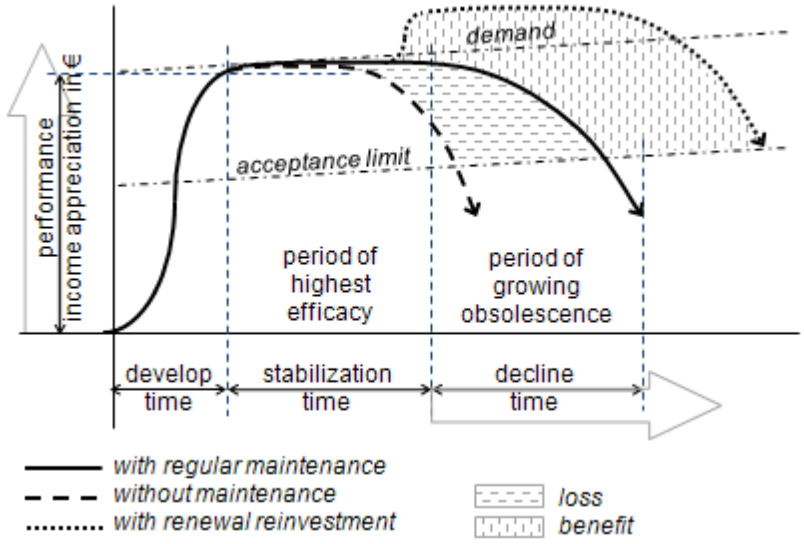

Fig.1. Obsolescence and service life curve

From the curve the above put together by André Thomsen and Kees Van Der Flier(2011), it is clear that ay the acceptance level maintenance is key. The level of maintenance a building accepts at this stage tell if demolition will be an option or if renewal will be recommended

RECOMMENDATION AND CONCLUSION

From the above study, time is the determinant for obsolescence. The building life cycle is determined by wholesomely looking at its performance after a period. It this therefore strongly recommended that every building components service life should be considered.

Secondly, maintenance culture and strategies should be improved on. If maintenance always comes to thought from the conceptual stage of building design, certain modalities will be put in place to elongate the service life of a structure.

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