BUILDING MAINTENANCE MANAGEMENT SYSTEMS (BMMS): CONTEMPORARY ISSUES IN PROMOTING HEALTHY HOUSING FOR HEALTHFUL LIVING

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Abstract

Healthy living environment is a product of a well designed maintenance plan. Ignorance and apathy to the efficacies of maintenance management initiatives have resulted in both overt and covert health implications and complications. This study demonstrated the variety of maintenance management systems as addendum to precautionary measure to check the infiltration of building associated diseases. The study was approached through two major paradigms: the first approach is internalized maintenance management operation where the occupants of the extant facilities were primary participants in the facilities maintenance; the second is externalized maintenance management system where professionals in the field of facilities management or other related fields are involved. The study presented an overview of the basic principles in maintaining and operating various building systems in residential facilities for health and safety. The discussion identified building systems and their components, operating characteristics, and general maintenance practices. Conclusively, health of residents of well maintained apartments can be enhanced if a well planned building maintenance management system is observed.

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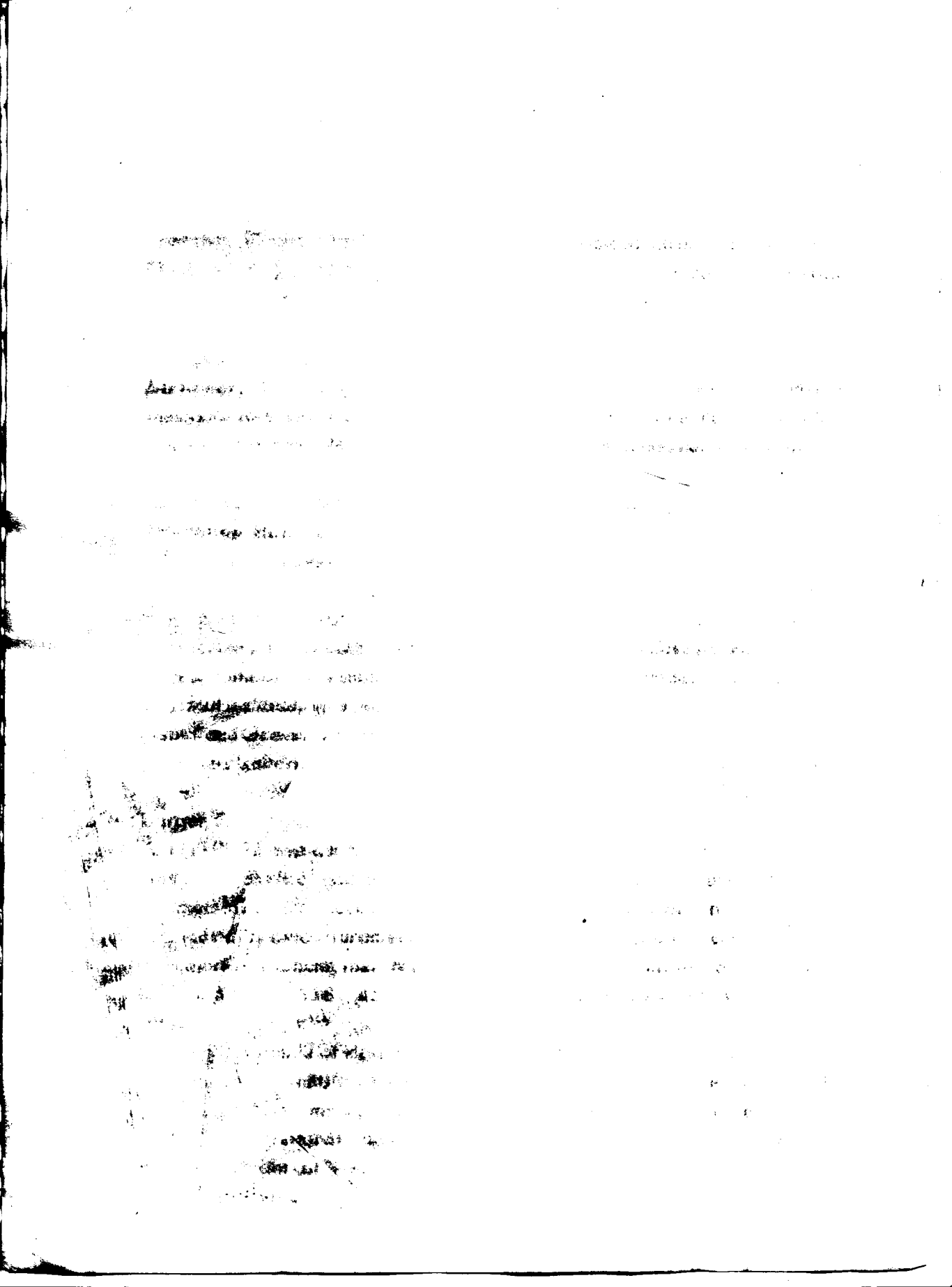

Introduction

This paper presents how adoption of maintenance management practise could help in keeping residential apartments healthy for a flourishing life. Advancement in health is a global interest and has drawn the attention of numerous organisations and institutions who advocated its success. The total health of man has a direct relationship with the sanitary condition of his dwelling. An ill-environment is an incontrovertible challenge facing mankind as constant generation of waste around us is at increase. Consequently, the demand for health care has increased in response to resolve the health malady.

It is difficult to conclude that the tardy response in tidying our living environment has immensely contributed to the increase in the existing health challenge. Looking around our homes and surrounding indicates that cleaning, sweeping, repairs and replacement of parts or whole components of our buildings are obvious. In one way or another, we are all involved in maintenance management. This paper approached maintenance management from two paradigms: the first is *internalized* approach which involves non-technical skill, regarded as soft facility management. This requires cleaning and sweeping and can be handled by occupants of the property or service providers. The second is *externalized* approach which is called hard facility management and requires the expertise of technical professionals in the specific areas that require attention.

One may wonder if maintenance of building is associated with the health of occupants. In response it may be necessary to verify in the first place, the relationship between housing and health since the issue at hand is about maintenance of housing. From various empirical studies reviewed, which attempted to verify if there were some relationship between housing and its possible association with health of the occupants, Ranson (1991) argued that the empirical evaluation of housing and health has proved difficult for some reasons which include,

- Housing and health studies have often failed to separate or take into account the multifactorial non housing variables that affect health such as poverty, ignorance, poor nutrition and lack of medical care.
- The direction of cause-and-effect relationship pertaining to housing and health variables also is often unclear. Thus if a particular housing factor is shown to be associated with a disease,

the question arises whether or not the disease has given rise to the factor or whether a third set of determinants was responsible.

* The indices for measuring health and hygiene quality of housing are often very insensitive, inappropriate and/or lack universal acceptability. This is a particular problem when assessing the intangible or aesthetic effects of housing on social wellbeing, in determining comfort levels and or measuring qualitative aspect of life.

Despite these drawbacks, World Health Organization, WHO Expert Committee on the Public Aspects of Housing concluded that lack of definite measurements does not denote the absence of a relationship between housing and health. By deductive assessment, a strong relationship can be established. Since the residential environment consist of many elements of the overall environment with each element capable of exerting individual detrimental effects upon health; it can be deduced that the effect of residential environment upon health is the sum of the individual factors.

This study anchors on this premise that a relationship exists between housing and health to advance maintenance management as a nostrum to monitor the excesses of disease infiltration to living houses and consequent effect on the residents. Lack of adequate information and apathy to the value of maintenance of residential properties in relation to advancing our health has driven many lives to extinction. Apart from death, many lives have been diseased and some physically injured. These mayhem were either apparent through collapse of structures; contagion through house-associated diseases or injuries sustained through protrusions. All of these misfortunes were offshoot of negligence to maintenance management. Unfortunately, many landlords pay heedless attention to maintenance of their properties or often give out the property to the hands of inexperienced (*quack*) property manager to manage; as a result, dilapidation usually sets in and the value of the property become physically and economically depreciated in addition to becoming injurious trap to the users. The health benefit derived from maintenance management of residential property is misapprehended by most property owners even the users.

Maintenance is a complex and multifaceted activity which until recently has attracted little study. According to British Standards Institute

(2003), maintenance is defined as 'The combination of all technical and associated administrative actions intended to retain an asset in or bring it to a state in which it can perform its required function'. This implies that there are two processes to be considered, 'retaining', i.e. work carried out in anticipation of failure and 'restoring', i.e. work carried out after failure. The former is usually referred to as 'preventive maintenance' and the latter as 'corrective maintenance'.

Frazier (1993) further asserted that neglect of property maintenance has accumulative results with rapid increase in deterioration of fabrics and finishes of a building accompanied by harmful effect on the contents and the occupants. It is highly desirable but hardly feasible to produce a building that is maintenance free, although much can be done at design stage to reduce the amount of subsequent maintenance work.

Statement of the Problem

In order to promote a healthy housing for healthful living in a most effective way, the issue of building maintenance management system need to be prioritized. The need for proactive response to both internalized and externalized maintenance approach will exterminate several building-associated health problems. Presently, most living houses and their vicinities are not well maintained thereby making the entire housing environment vulnerable to diseases. The present approach to housing maintenance is mostly reactive method. This approach does not foresee future maintenance problem but deals with immediate maintenance demand. Another weakness of this approach is delay in maintenance and this could increase the level of health risk of the occupants.

If this approach is not revisited by adopting building maintenance management system which transmits the concept of internalized and externalized maintenance management technique, on the platform of proactive maintenance approach, then the issue of promoting healthy housing for healthful living will be unrealized.

The Purpose of the Study

1. To explore the need for proactive approach to handle internalized building maintenance management for healthy living
2. To investigate the important areas that would require routine cleaning and how to administer the maintenance for healthiness.
3. To enlighten on the relevance of externalized building maintenance

approach for healthy living.

Proactive Approach to Internalized Maintenance Management for Healthy Living

Majority of people do not give urgent attention to what this study regards as internalized building maintenance. Their major attentions are usually focussed on broken parts of the building or related components such as cracks on wall; loosed hinges of doors and windows; broken ceiling; leaking roof; broken floors, pipes and water closet, etc. This section of the study examined maintenance from daily cleaning (*sweeping and dusting*) of houses. Angie (2011) demonstrated the importance of home cleaning and various techniques adequate for various fabrics, remarking also that whether you hire a professional cleaner or do the job yourself, the fact is, our homes need to be cleaned. The homes get dirty, attract scuffs and accumulate spills.

Healthy environment plays major role in safeguarding our family from sickness and allergies. Some severe health problems are spreading all over the world and this is due to pollution and unhygienic surrounding. But, people are getting aware about the affects of dirt and pollution caused due to unhealthy environment. The best way to get rid of all the dirt and pollution is by opting for cleaning services. But what kind of cleaning materials should be used for different fabrics?

Asphalt tile for instance will require to be mopped every week using 1 cup of fabric softener in half a pail of water. Don't flood the floor, since excess water can loosen adhesives and grout. Glazed ceramic is virtually stain proof; however if it is unglazed, that means it is porous and will need to be sealed. Don't use harsh abrasives, acids or strong soaps on unglazed ceramic. Mop with all-purpose cleaner, and dry with a soft cloth. Strip unglazed ceramic once a year and rinse thoroughly afterward. Since concrete is very porous, it stains easily. Prior to sealing with a commercial sealer, sweep up loose dirt, and clean with an all-purpose cleaner.

Important Areas for Routine Maintenance Management for Healthy Living

In the case of ceiling cobwebs and baseboard dust in our homes and offices, lifting up our eyes will show cobwebs collected along the top edge of the wall where it meets the ceiling, especially in corners. Use a long-handled dusting tool on these at least monthly. Wipe down your baseboards and trim, which tend to collect dust. This can be done with a furniture polish or with a rag

dampened with water.

According to Levi (1996), cobweb spiders are common inhabitants of dark corners around the home. They have a generally bulbous body and create messy webs with sticky threads. The majority of these spiders are harmless, although one group, the widow spiders in the genus latrodectus, are potentially dangerous to health. Most spiders are not aggressive and bite only when trapped against the skin. It should be stressed that spider bites are difficult to diagnose correctly as there are many other medical conditions that mimic the same symptoms. From a biological standpoint, it is rarely necessary to control spiders. However, if it is desirable to get rid of spiders in the home, a combination of sanitation and pesticides should be effective.

In the case of bacteria, the doorknobs, lots of hands touch them every day and leave germs behind. According to Dallas (2013), researchers involved 40 homes and wiped nine of the common surfaces in these residences —TV screens, kitchen counters, toilet seats, refrigerators, pillowcases and door handles —with sterile swabs to determine the types and amount of bacteria present. It was found more than 7,700 types of bacteria in the homes, with unique groupings of bacteria depending on the location tested.

For instance, bacteria found in refrigerators, on kitchen counters and on cutting boards were usually similar since they all related to food. The bacteria on doorknobs, pillowcases and toilet seats were also similar, but came more often from humans. "We leave a microbial 'fingerprint' on everything we touch," "Sometimes those microbes come from our skin, sometimes they're oral bacteria and as often as not they're human fecal bacteria."

In the case of pets, the biggest difference found so far is whether you own a dog, there are bacteria normally found in soil that are 700 times more common in dog-owning households than in those without dogs." The study showed bacteria in homes can be grouped into three "habitats" or categories: places people touch, places touched by food and places that collect dust. The researchers pointed out the bacteria found on pillowcases in two different homes is likely [illegible] than bacteria found in the same home but in another "habitat."

Tools & supplies for Internalized Maintenance

Before you begin tackling the challenge of cleaning the house, you will want to make sure you have all the necessary items on hand.

From tools of the trade, such as vacuums and rags, to cleaning products like Windex and baking soda, this list can serve as a comprehensive guide to assist you with house cleaning.

Vacuum cleaner is the best way to begin cleaning a room so as to eliminate the dust, dirt and visible debris. Go over all carpeted and bare floors with an upright or handheld vacuum cleaner. Regular vacuuming will also significantly improve the appearance and life of your carpets. The next is to mop the floors after your home are vacuumed, a mop is vital for getting rid of stains and eliminating bacteria from the floor. Choose a mop with a longer handle so that you are comfortable using it, and pair it with a bucket full of warm water and a cleaning solution.

Windex is the cleaning product designed to remove smudges and stains on your glass items, such as tables, windows or mirrors. Spray it directly on the glass surface, and wipe it off with a clean rag, or wipe it down with a squeegee. If you can only have one cleaning product in your home, it should be a spray bottle of all-purpose cleaner. It can be sprayed on most household surfaces and wiped off to easily remove bacteria, germs, smudges and stains.

Since steaming tools use water to help with the cleaning process, they tend to be healthier for the environment than many toxic-laced commercial products. Also, weigh whether the use of recycled products may be more environmentally friendly than taking up the resources you would use for laundering.

Externalized Building Maintenance Approach for Healthy Living

This aspect of maintenance involves the control of the physical structure of our living houses as it pertains to repair, replacement and prevention. Good property management, according to Dasso & Ring (1985) demands a thorough knowledge of building services and maintenance requirements. Flaws and hazards should be checked for inside walks, stairs where available, flooring, roofing, wiring, plumbing, or anywhere inattention may cause an accident. Maintenance of residential housing just like every other facility requires strategies that will sustain the facilities in order to fulfil its essential objectives.

Jan (1995) pointed out that Operation and Maintenance (O & M) organization is typically responsible for operating utility systems and for maintaining the built environment. He established that to accomplish this, the Operation and Maintenance (O&M) organization must operate the systems and equipment responsibly and maintain them properly;

stating that the maintenance work may include preventive/predictive/planned maintenance; corrective (repair) maintenance; replacement of obsolete items; predictive testing, inspection, overhaul, and grounds care.

According to Piotrowski (2001), the need for maintenance is predicated on actual or impending failure – ideally, maintenance is performed to keep equipment and systems running efficiently for at least design life of the component(s). As such, the practical operation of a component is time-based function.

Consider the graph below that shows the failure rate of a building versus time (period). The graph takes the "bathtub" shape shown below. In the figure, the Y axis represents the failure rate of the building and the X axis is time (period) of the building life. From the shape, the curve was divided into three distinct periods of the building life: infant mortality of the building, useful life period of the building and wear-out periods of the building. The initial infant mortality period of bathtub curve is characterized by high failure rate followed by a period of decreasing failure rate. Many of the failures associated with this region are linked to poor design, poor installation, or misapplication. The infant mortality period is followed by a nearly constant failure rate period known as useful life. There are many theories on why building components fail in this region, most acknowledge that poor Operation and Maintenance (O&M) often plays significant role.

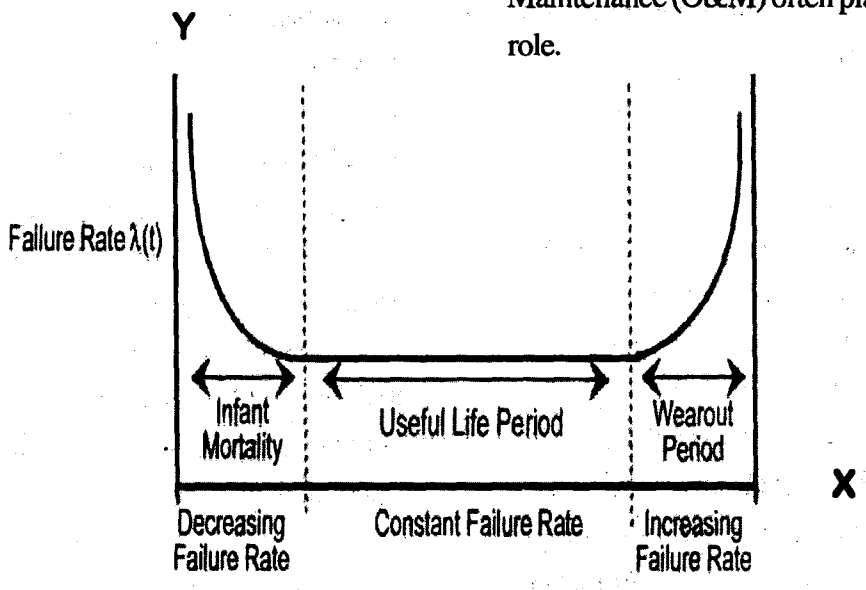

Fig. 1: Failure rate of a building versus time (period).

Source: O&M Best Practices Guide, 2001

Jan (1995) suggested that Operation and Maintenance (O&M organizations may utilize a Reliability-Centered Maintenance (RCM) programme that includes the optimum mix of reactive, interval-based, condition based, and proactive maintenance (predictive/ planned) practices. In considering the cost requirement, Ronald and Neri (1990) argued that these primary maintenance strategies, rather than being applied independently, are integrated to take advantage of their respective strengths in order to maximize building/ equipment reliability, while minimizing life-cycle costs." The maintenance system cannot be fully discussed individually in this paper because of the limitation and focus of the paper in the direction of health implications.

Conclusion

More lives may be preserved and the health of individuals can be enhanced when adequate maintenance and precautionary measures are observed. When we adopt the necessary house cleaning approach and tools or employ reliable service provider to take care of house cleaning; there will be an obvious elimination of disease infiltration through dirt and other entry points. If maintenance managers can also approach the maintenance of our houses through preventive measure biased in proactive approach rather than the reactive measure; several accidents and health hazards will be avoided. It can be seen that the health of residents of houses are secured in a maintainable and well maintained houses.

Recommendations

- During the planning stage of the project, design a proactive housing management program to anticipate housing problems, rather than reacting to problems when they occur. This plan is essential to ensuring optimal long- and short-term use of the facility.
- Appropriate planning decisions can support custodial care, ease of maintenance of facility grounds and building equipment, materials and surfaces, as well as support the flexible scheduling of space for future programs.
- Ensure that program schedules and maintenance schedules are cohesive and compatible. Regular inspection of building components and wares should be conducted.

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