

A study of Factors Affecting for Maintenance and Rework for a Building— A Review Work

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Abstract

In basic need of human being, shelter is one of important need of human. The basic function of building is to protect the user of building from weather, mainly rain, wind and extreme temperatures. Building maintenance and rework is the two sides of one coin which is closely related to each other. Building maintenance is work carried out to keep, restore or improve every part of building, its services to a currently acceptable standard and to sustain utility and value of the facility. Poor and improper building maintenance will definitely call for more damages and costly repair works if left unaddressed. Many building components deteriorate over time, causing adverse effects on system function. This results in physical condition loss over time because of age, use, wear and tear & damage, etc. Building maintenance and rework is the combination of technical and administrative actions to ensure the items and elements of a building in an acceptable standard to perform its desired function. In this paper we try to find out the factors which are affecting the maintenance and rework, moreover for maintenance through questioner design and survey.

Key Words- Building Construction, Building Maintenance, Building Rework, Questioner design and Survey

1. INTRODUCTION

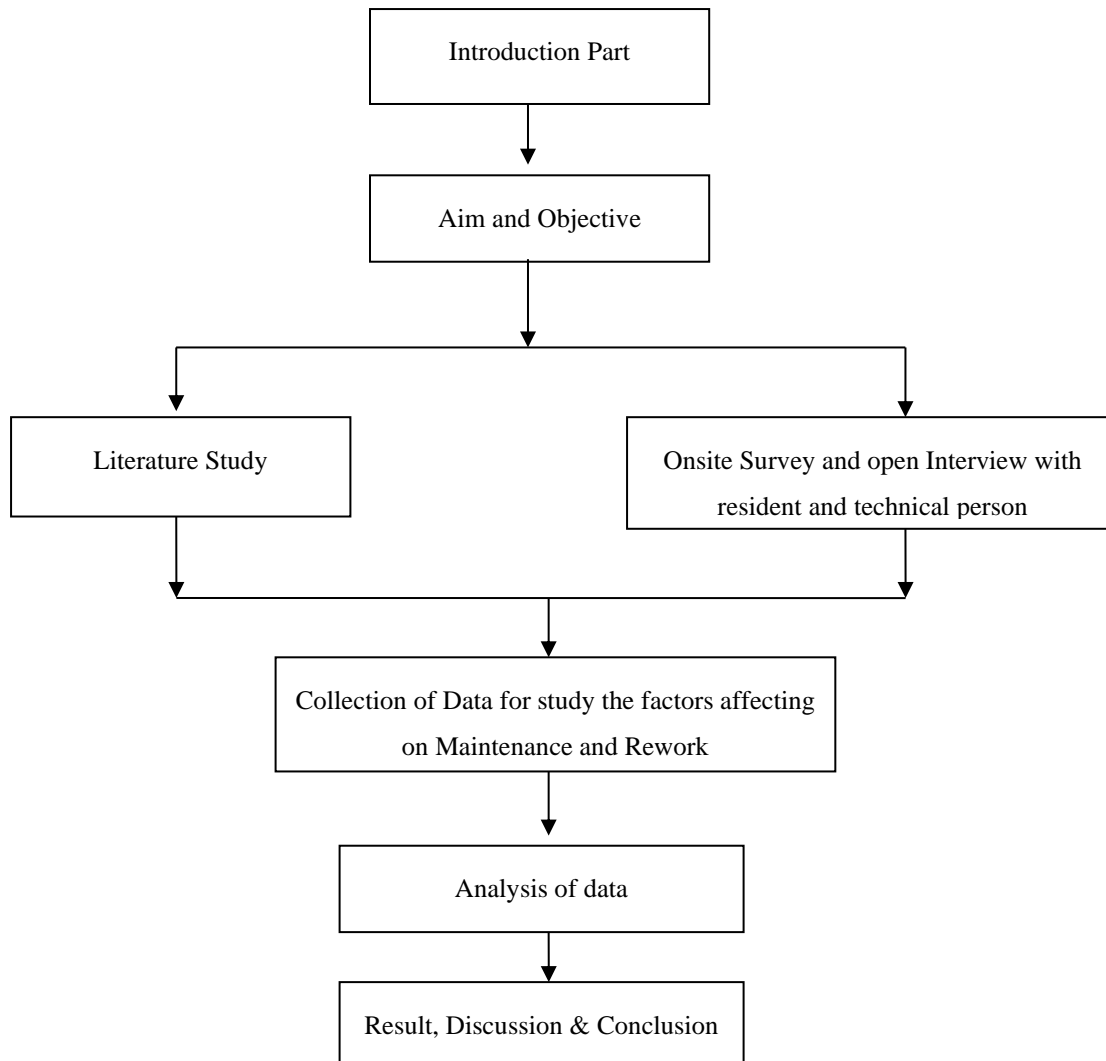
One of most important issues in the context of urban housing is concern with maintenance management. Maintenance management is required to maintain a building's initial performance capacity this can be done by means of regular reinvestments in maintenance. Without maintenance performance will not meet the demand and eventually will drop below the limit of acceptance of residence. Many building components deteriorate over time, causing adverse effects on system function. This results in physical condition loss over time because of age, use, wear and tear & damage, etc. Due to aging of buildings its components have decreased performance and user utility compared with new construction. Actions can be taken, however to slow down this utility loss. These actions include maintenance, repair and renovation. Rework is a major contributor to project cost and project schedule. Many factors are responsible for such delay & over-runs. Among these factors 'rework' is the factor require to give a special attention. So there is a need to develop a tool which can be applied to construction projects in order to eliminate or reduce the occurrence of rework. Maintenance and rework are closely with each other, because whenever maintenance is carried out, it's requiring rework also. In this paper we try to find out the factors which are affecting the maintenance and rework, moreover for maintenance through questioner design and survey.

2. AIM & OBJECTIVE OF PAPER

To study the factors affecting on maintenance and rework of building. Following are the objectives of this project,

- [1] To identify the various factors affecting on maintenance and rework of building through literature review by using journals, papers, books, etc..
- [2] To design the methodology and questioner for collection of data from various sites or building.

3. METHODOLOGY



Flowchart No. 01 Flowchart of Project Work

4. LITERATURE REVIEW

As per Bon-Gang Hwang, Stephen R. Thomas, due to rework problem cost & performance of project affected. Through the data obtained from 359 construction projects, the author try to find out impact of rework construction companies by categories the factors. This paper provides overviews of the impact of rework on construction cost performance, thus helping to reduce rework and improve project cost performance. As per author to manage rework, it is necessary to identify and classify its causes firstly. As per author they find two hypostatic are, There are statistically large variations in the impacts of remodel on development price overall performance for the various project groups, and There are statistically big variations in the rank orders of transform sources.

In this paper of Roslan Talib, A Ghafar Ahmad and et.al.., In this research paper the researcher separate the group the ask the questions on Surveyed Factors Affecting Maintenance of Public Building and Surveyed Factors Affecting Defects of Public Building. These factors are Lack of preventive maintenance method, Insufficient funds to maintain the buildings, Lack of building maintenance standard procedures, Poor work rectification done on buildings, Unavailability of skilled appointed maintenance personnel, Non response to maintenance request, Moisture problem from wet areas leading to leakage, Environmental conditions, Poor quality control: preventive method, Defective

materials used for maintenance works, Overlooked site conditions etc.. As per researchers Lack of preventive maintenance method is the most affecting factor in Surveyed Factors Affecting Maintenance of Public Building while, Lacking in maintaining the buildings in the Surveyed Factors Affecting Defects of Public Building.

In the research paper of Olajide Faremi, Olumide Adenuga et.al., the researcher focus on finding the factors affecting maintenance cost of institutional buildings. They found that the factors Building age, building size, vandalism, faulty designs, poorly integrated building services, substandard building materials, and failure to execute maintenance at the right time were seen to high degree of influence as factors responsible for high cost of maintenance in institutional buildings. The researcher concludes that routine maintenance and repair works should be timely to avoid further deterioration. Building designs should be critically reviewed at the preconstruction stage from maintenance perspective by experienced maintenance personnel with a view to achieving ease of maintenance at the operation and maintenance phase of the building.

As per Amik Garg and S.G. Deshmukh, the reason of this paper is to evaluate the literature on renovation administration and propose feasible gaps from the factor of view of researchers and practitioners. The paper consists of a complete record of publications on the discipline in query and their classification in accordance to more than a few attributes. The paper will be beneficial to researchers, upkeep specialists and others involved with renovation to recognize the significance of preservation management. The paper finds that essential troubles in upkeep administration vary from a number optimization models, protection techniques, scheduling, and facts structures etc. Within every category, gaps have been identified. A new shift in protection paradigm is additionally highlighted.

The author Ali Hauashdh, Junaidah Jailani and Ismail Abdul Rahman focus on Identified and labeled constructing protection issues, their results and the manner ahead, and additionally advanced a conceptual version that demonstrates the affiliation among issues, their results and the manner ahead. The manner ahead of the conceptual version specializes in powerful management, technical capability, improvement of human assets and price optimization. As per author, the phase offers constructing protection exercise problems. It additionally discusses their results on organization, protection carrier overall performance, constructing overall performance and the satisfaction degree of the buildings 'users

The author Akin Adejemi, discuss about the role of Architect in the poor building maintenance in Nigeria. AS per author, most the buildings were left un-maintained largely due to No replaceable building materials for the foreign ones used, No enough skilled technical personnel to carry out such maintenance, the technology used was foreign to the generality of people, The designs were done outside the country Economic recession was harsh and did not support foreign exchange, The local building materials industry was not developed to produce such materials, No serous research into building materials for local production.

According to James Sommerville, the constant media attention to the defects and the resulting redevelopment has been carried out, in new building projects, especially homes. The aim of this paper was to review the literature covering the phenomenon of defects and redesign in new constructions; identify the challenges on the mainstream research agenda and suggest how they can be addressed in order to stimulate the development of more analytical tools for industry to characterize, model, evaluate and communicate defect decisions and redesign. The work done by various research groups and writers over the past 25 years has shown that the problem of recycling can be investigated and broken down into its many components. What has not happened is the amalgamation of these works into a coherent whole, which could later become the genesis of a comprehensive effort to solve problem areas.

As per the Mills, the goal of the guide is to offer all constructing users with a not unusual place system of maintenance, information recording and retrieval for the proper guidance of maintenance operatives, constructing owners, maintenance involving operatives, costing, and preferred maintenance. This might act as a not unusual place a part of the constructing process and not as a series of isolated events that takes place after the crowning glory of the constructing.

5. RESEARCH GAP

After studying various literatures, we found that there is less study for maintenance and rework conducted as per the own country of researcher. But in India or Indian scenario less study and less research done by researcher. So here we are trying to preparing the questioner to fulfill this gap in simple manner

6. QUESTIONER DESIGN

By using the various literatures we prepare a questioner for Determine the factors which are affecting the maintenance and reworks. For creating of this questioner we mainly focus on some of the basic questions and some of the important

factors which already found by various researchers. Here we are use the rating scale of Strongly Agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly Disagree (1). In this questioner 3 sections are provide. First for general information of participant, while second parts cover specific questions on factors affecting the maintenance of building and third part Actual factors affecting the Maintenance and Rework.

Nature of Participant-
Name of Company--
Name & Address of Project --
Name of Participant with Designation & Contact No.--

A] Specific Questions on Factors Affecting the Maintenance of Buildings

Question	Answer				Remarks, if any
1] What is the age of building?	Less than 5 years	6-10 years	10-15 years	More than 15 years	
2] How Much Time maintenance carried out in building?	Up to 10 Times	Up to 20 Times	Up to 30 Times	More than 30 times	
3] What is the maintenance cycle for your building?	Every 6 Months	Every Year	Every 3 Years	No maintenance	
4] Average expenditure on maintenance as per cycle of maintenance?	Upto 50 Thousand	Between 50K to 1 Lack	Between 1 Lack to 2 Lacks	More than 2 Lacks	

B] Questions Based on Actual factors affecting the Maintenance and Rework -

Marks for Question is as per follows,

- 1) 1 – Strongly Disagree 2) 2 - Disagree
 3) 3 – Neutral
 4) 4 - Agree 5) 5 – Strongly Agree

Factors	Category	RESPONCE				
		1	2	3	4	5
Technical Factors	Improper Design					
	Inadequate specification					
	Inadequate site investigation					
	Non-identification of true defects					
	Faulty Maintenance Operation					
	Characteristics of Building					
Financial factors	Poor Finance Condition					
	No Control over Expenditure					
	Increased material cost due to delay					

	No fund reserve for maintenance					
Socio- Environmental factors	Water Logging Problem in Rainy Season					
	Extreme weather condition					
	Natural Disasters Fighting system					
	Inadequate and unqualified contractors and labor					
	Lack of new maintenance techniques					
	Approach of building user					
	Improper use of buildings					
	Ignorance about maintenance works					
	Maintenance Management Factors					

Sign & Stamp of Respondent

Before giving the questionnaire to the respondent person, following information was described.

- The person just has to give rating by making tick into the box & answer the question by tick only.
- Each question carries only one answer
- Use five point scales etc...

7. DISCUSSION & CONCLUSION

After studying various literatures, we found that there is less study for maintenance and rework conducted as per the own country of researcher. But in India or Indian scenario less study and less research done by researcher. So here we are trying to preparing the questioner to fulfill this gap in simple manner. This questioner survey helps us to study the factors affecting on maintenance and rework of building as well as its also helpful to focus on factors which are responsible for maintenance and rework.

8. FURURE SCOPE

Next time we collect the data from various construction companies and building also for their views regarding to study the factors affecting on maintenance and rework of building through questioner survey. We use RII method to find out the factors & try to suggest some recommendation for constriction companies.

9. REFERENCES

- [1] Assaf S. (1996); Effects of Faulty Design and construction in Building Maintenance, Journal of Performance of constructed Facilities Nov 1996 P. 171.
- [2] Ajetomobi Oludare Olayinka¹ and Olanrewaju Sharafadeen Babatunde Owolabi “ Evaluation of the factors affecting housing maintenance and its probable solutions” International Journal of Latest Research in Engineering and Technology Volume 1 Issue 4 September 2015
- [3] Mills, P. Williams, D. Yu. (2010). “Benchmarking construction rework in Australian Housing”. Int. Journal for housing science vol.34, 207-220.
- [4] Bon-GangHwang et.al.(2014) “Investigating the client-related rework in building projects: The case of Singapore”, Int. Journal of project management vol.32, 698-708
- [5] Roslan Talib, A Ghafar Ahmad at.el., “Assessment of Factors Affecting Building Maintenance and Defects of Public Buildings in Penang, Malaysia”, Architecture Research 2014, 4(2): 48-53, DOI: 10.5923/j.arch.20140402.03.
- [6] Olajide Faremi, Olumide Adenuga. At.el., Factors Affecting Maintenance Cost Of Institutional Buildings, 9th Unilag Annual Research & Fair, Oct-2014.
- [7] Ali Hauashdh, Junaidah Jailani at.el., “Building maintenance practices in Malaysia: a systematic review of issues, effects and the way forward”, International Journal of Building Pathology and Adaptation © Emerald Publishing Limited ,2398-4708. DOI 10.1108/IJBPA-10-2019-0093.
- [8] Amik Garg and S.G. Deshmukh,” Applications And Case Studies Maintenance management: literature review and directions”, Journal of Quality in Maintenance Engineering, Vol. 12 No. 3, 2006 pp. 205-238, q Emerald Group Publishing Limited, 1355-2511, DOI -10.1108/13552510610685075.

- [9] Akin ADEJIMI, “ Poor Building Maintenance In Nigeria: Are Architects Free From Blames”, ENHR International conference on “Housing: New Challenges and Innovations in Tomorrow’s Cities” ,Iceland , June-2005,p.p-1-15.
- [10] James Sommerville, “Defects and rework in new build: an analysis of the phenomenon and drivers”, Structural Survey, Vol. 25 No. 5, 2007, pp. 391-407 , Emerald Group Publishing Limited, 0263-080X, DOI 10.1108/02630800710838437.
- [11] Ahmad Suffian, “Some Common Maintenance Problems and Building Defects: Our Experiences”, The 2nd International Conference on Rehabilitation and Maintenance in Civil Engineering, Sci Direct, *Procedia Engineering 54 (2013) pp.101 – 108*.
- [12] A Straub, “Maintenance and Repair”, International Encyclopedia of Housing and Home, 2012, Vol. 4, 186-194. DOI: 10.1016/B978-0-08-047163-1.00523-3.
- [13] Sunday Julius Odediran, Oladele Ayinde Opatunji, “Maintenance of Residential Buildings: Users’ Practices in Nigeria”, Journal of Emerging Trends in Economics and Management Sciences (JETEMS) 3(3): 261-265.
- [14] Michael N. Grussing¹, Liang Y. Liu² “Knowledge based Optimization of Building maintenance, Repair and Renovation activities to improve Facility Life Cycle Investments” ASCE 2014
- [15] Muhammad Jamaluddin Thaheem¹ and Alberto De Marco² “Sustainable Repair & Maintenance of Buildings in the Developing Countries” Journal of Civil Engineering and Architecture Research Vol. 1, No. 1, 2014
- [16] N. Ahzahar, N.A. Karim, S.H. Hassan, J. ” A Study of Contribution Factors to Building Failures and Defects in Construction Industry” The 2nd International Building Control Conference 2011