

Compliance of Project Scope Management For Residential Building

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Abstract: When a construction site is being built, the constructor raises a fence on the site defining the boundaries of the construction. This process of building a fence is called scoping. Scope management is the process of defining what work is required and then making sure all of that work and only that work is done. Scope management plan should include the detailed process of scope determination, its management, and its control in advance. The project manager must seek formal approval on a well-defined and clearly articulated scope. To identify scope, requirements must be gathered from all stakeholders, sponsors. The project scope is the work, the project will do to deliver the product of the project. The work of scope management includes the planning, coordination, and management activities that ensure the product scope is achieved. These efforts are a part of the project management plan and are further a part of the scope management plan. In this projects using MSP, we are going to schedule a projects and study the project scope management regarding case studies. At the end of the project or the phase, the completed work is compared against the scope baseline in the project management plan to determine if the scope has been successfully completed.

Keywords: Management, MSP, project scope, stakeholders, scope baseline.

I. INTRODUCTION

Planning has long been a subject of discussion in the building industry. Many guides have been developed and much knowledge resides with experienced practitioners (Griffin 1972; Pena 1987; Billings 1993; Preiser 1993; Haviland 1996; Cherry 1999; ASCE 2000). However, early planning in many cases is not performed well in the building industry. Consequently, the building sector suffers from poor or incomplete scope definition, frequently experiencing considerable changes that result in significant cost and schedule overruns (Gibson et al. 1997; Cho et al. 1999; Cho 2000). Because of these problems, there existed a need for a better method of assisting in defining project scope. The building industry is different from the industrial sector in various ways, such as the approach of planning, design, and construction of facilities; the owner's perspective; the architectural focus; and so on. Nonetheless, there are many similarities. Like the industrial sector, the building industry suffers from poor or incomplete preproject planning. At the time of this study, a quantitative understanding of scope definition issues for buildings had not been well-studied and no tool existed to help with scope definition. As developed, the PDRI for Building Projects is a user friendly checklist that identifies and precisely describes each critical element in a project scope definition package to assist project managers in understanding the scope of work. It provides a means for an individual or team to evaluate the status of a building project during preproject planning with a score corresponding to project's overall level of definition. The PDRI helps stakeholders of a project quickly analyze the scope definition package and predict factors that may impact project risk specifically in regard to buildings.

One of the major sub processes of the Preproject planning process is the development of the project scope definition package. Project scope definition is the process by which projects are defined and prepared for execution. It is at this crucial stage where risks associated with the project are analyzed and the specific project execution approach is defined. Success during the detailed design, construction, and start-up phases of a project is highly dependent on the level of effort expended during this scope definition phase (Gibson and Hamilton 1994). The new tool, the PDRI for Industrial Projects, is a project management tool that assists in calculating a

total score representing the level of project definition. Developed specifically for industrial projects, the PDRI provides project team members with a structured approach for developing a good scope definition package.

- Average cost savings of 19% versus estimated for design and construction.
- Schedule reduction by 13% versus estimated for design and construction.
- Fewer project changes.
- Increased predictability of operational performance.

With the success of the PDRI for industrial projects, many building industry planners wanted a similar tool to address scope development of buildings.. The rest of this paper will introduce the PDRI for building projects. The paper will conclude by describing the potential uses of the PDRI and summarizing its benefits to building construction practitioners.

1.1 What is scope:

The scope of a project can be defined in terms of the functionality which the project is intended to provide, attain, or span. A project scope statement defines, in writing, drawings and price figures, the intended span of work expected and to be provided for in plans for a new facility. The scope statement should also spell out expectations about any eventual extensions, and should include a contingency policy as well. The scope statement should be a clear communication of the extent and functionality of the facility, between the proposers, sponsors, designers, constructors and the users or purchasers. In order to be explicit as to the meaning or extent of various systems, scope may be further described in terms of cost budget figures. Such budget figures need to be expressed in enough detail to provide the basis for a cost control system and for evaluating any subsequent changes to that scope. According to Frederick, a technical scope document is what describes the project's physical characteristics, establishes the design basis, and provides input to civil-structural, architectural, plant design, mechanical, electrical, and control systems disciplines.

1.1.1 Scope changes:

Any change, at any stage, in the functionality of the project or facility is termed a scope change. All other changes which result from design errors and omissions, acts of god, or changed conditions are classified as refinements or alterations. Overruns resulting from alterations, refinements and cost escalations are independent of scope changes. The change in functionality can be of three types and can be in the horizontal or vertical direction as mentioned below-

- 1) Change in the capacity of functionality.
- 2) Change in the quality of functionality.
- 3) Complete change in the functionality.

1.2 Increasing size of change:

Sometimes if the the capacity or size of a item, activity or portion of a project is changed the functionality of that item, activity or portion does not change. But if the size is increased to such an extent that a change in functionality occurs, then it can result in scope modification. To understand this, consider for example, that a tunnel is being constructed which also has utility lines passing through it. If it so happens that there is a change in the design sizes of the utility lines. Up to a certain extent we might be able to adjust them in the same dimensions of the tunnel, but if the change is large enough the dimensions of the tunnel might have to be changed. Such a change might itself be a scope change or cause a change in scope for example, the ventilation system might need relocation and redesign, and the new design might be functionally different from the previous one.

1.3 Objectives of study:

- To identify the scope of residential building by refereeing PMBOK.
- To Study factors affecting the project scope management.
- To Implement WBS for satisfying the project scope.
- To Develop WBS programme using tool MSP.
- To check effectiveness of MSP programme for satisfying the project scope using questionnaires survey.

II. METHODOLOGY



2.1 What is project scope and its management?

Scope refers to the detailed set of deliverables or features of a project. These deliverables are derived from a project's requirements. PMBOK defines Project Scope as the "The work that needs to be accomplished to deliver a product, service, or result with the specified features and functions." There are three processes of Project Scope Management- Planning, controlling, and closing.

2.1.1 Planning: The planning process is when an attempt is made to capture and define the work that needs to be done.

2.1.2 Controlling: The controlling and monitoring processes focus on documenting tracking, scope creep, tracking, and disapproving/approving project changes.

2.1.3 Closing: The final process, closing includes an audit of the project deliverables and an assessment of the outcomes against the original plan.

2.2 The scope statement: The scope of a project is the clear identification of the work in documents that is required to successfully complete or deliver a project.

2.3 Steps involved in project scope management: Step 1—Define project needs.

Step 2—Understand the project objectives.

2.4 Steps for defining the scope of a project:Project objectives- Goals- Sub-phases- Tasks- Resources- Budget- Schedule.

2.5 Project Scope Management Processes:



Fig.2.1 Scope Management Process

2.6 Plan Scope Management:



Fig.2.2 Scope Management Plan

2.7 Collect Requirements:



Fig.2.3 Collect Requirement Process

2.8 Create Work Breakdown Structure (WBS):

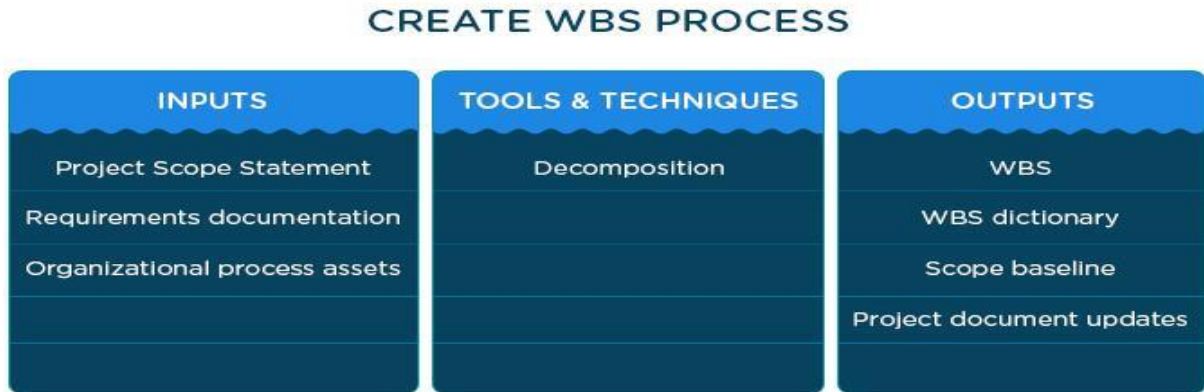


Fig.2.4 Create WBS Process

2.9 Factors affecting project scope management: Client requirement, Cost effectiveness in building designing, Time management and Risk factors are the factors which affects the project scope.

2.10 WBS in MSP:

The Work Breakdown Structure (WBS) is a hierarchical decomposition of the project objectives into deliverable-oriented tasks that are executed by the project team to accomplish the overall project goals. The WBS forms the backbone of all the project planning activities. The WBS divides the scope of the project work into smaller, manageable work packages for maintaining better control of the project activities.

III. CASE STUDY 1- “COOL HOMES”

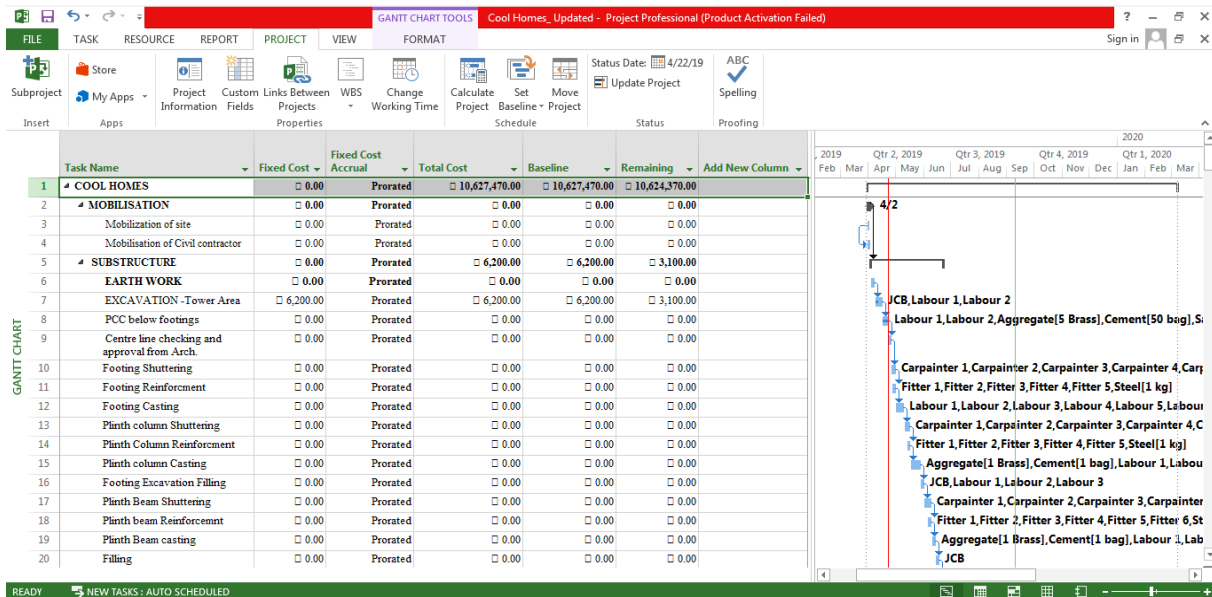


Fig.3 Cost Of Cool Homes in MSP with Scope Management

IV. CASE STUDY 2- “18 LATITUDE”

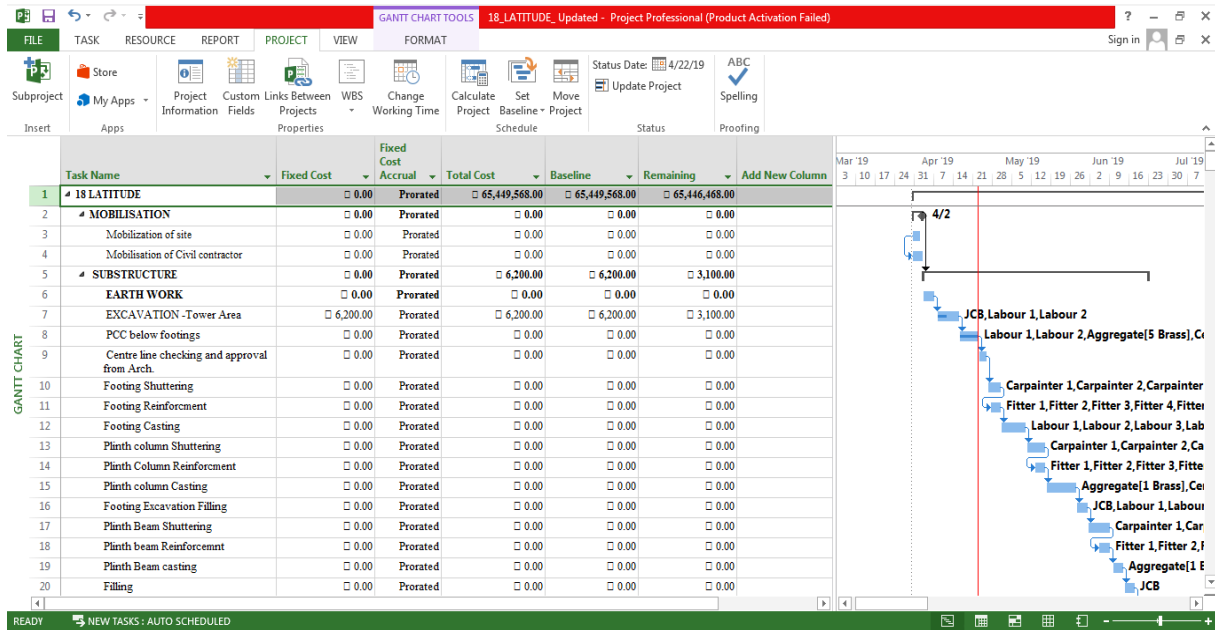


Fig.4 Cost of 18 Latitude in MSP with Scope Management

V. CONCLUSION

- The study investigated project scope management practices among organizations in the construction sector in Cool homes/18 Latitude and examined the determinant factors for the choice of project scope management practices employed in the organizations.
- The study revealed that major project scope management practices employed by construction firms were define project scope, create work breakdown structure, verify scope, and control scope.
- The adoption of project scope management practices by construction organizations in both case studies are majorly affected by ‘Competitive advantage’, ‘Complex project scope statement’, ‘Client demand’ and ‘Return on investment’. This will eventually ensure profitability, better return on investment and continued market share.
- “Cool homes” is located in highly humid area (Bhusaval), therefore scope of project was to design a home which is comparatively cooler than outer side temp. That’s why in that project, the windows, doors, cavity walls and elevation is design accordingly (Flat rate is 1300 Rs./Sqft).
- While in “18 Latitude”, It is located in Pune, but its scope is commercial and accordingly to that scope, it is constructed as a post tension flat slab system(Flat rate is 2300 Rs./Sqft).

REFERENCES

1. Shweta Kasnale * et al., 6(7): July, 2017 ‘ANALYZING PROJECT SCOPE DEFINITION COMPLETENESS BY USING PDRI FOR AN INFRASTRUCTURE PROJECT’
2. Maja-Marija Nahod et al., June 2012 ‘Scope Control through Managing Changes in Construction Projects’
3. Robert T. Hans et al., Vol.4, No.4, July 2013’ WORK BREAKDOWN STRUCTURE: A TOOL FOR SOFTWARE PROJECT SCOPE VERIFICATION’
4. Pierre-Majorique Léger1 et al., Vol. 6, No. 3; 2013’ Scope Management: Core Information System Implementation Project Pedagogy’
5. A. O. Ogunberu et al., Volume 16 Issue 3 Version 1.0 Year 2016’ Factors Affecting the Choice of Project Scope Management Practices among Construction Organizations’
6. Davy B. et al., 2014 ‘Multi-Agent Based Simulation in Software Project Management: Scope Management Representation and Visualization’

7. Chung-Suk Cho and G. et al., December 01, 2001 evaluated the status of a building project during pre-project planning.
8. Timo Käkölä et al., December 2015' Validating the Design Theory for Managing Project Scope during Software Sourcing and Delivery'
9. Peter R. Dumont et al., September 1997 measured and managed the level of scope definition as project planning progressed. Following are the highlights of their research.
10. Chu Tih-Ju et al., (2014) developed IGBP-PDRI model to enhance the performance of project execution, in making buildings energy efficient and reduce carbon emissions
11. Evan Bingham, G. et al., March 1, 2017 have developed a novel risk management tool, called the project definition rating index (PDRI) for infrastructure projects.
12. Project Management Body of Knowledge (PMBOK) :6th Edition.
13. 'Chung-Suk Cho and G. Edward Gibson Jr., 2 Members, Asce building Project Scope Definition Using Project Definition Rating Index' December 2001
14. Bingham, E., 2010. Development of the Project Definition Rating Index (PDRI), Arizona: Arizona State University.
15. Chileshe, N. & John Kikwasi, G. (2014) 'Critical success factors for implementation of risk assessment and management practices within the Tanzanian construction industry', *Engineering, Construction and Architectural Management*, 21(3), pp. 291–319.
16. Mohamed, A. H. 1997. Total Quality Management in Construction Projects: Roles of Clients Project Managers. *Jurnal Teknologi*, 27, pp. 23-36.
17. Steyn, H., 2008. *Project Management A Multi-Disciplinary Approach* 3rd Edition. Pretoria: s.n. FPM Publishing.
18. Weijde, G. A. 2008. *Front-End Loading in the Oil and Gas industry; Towards a Fit Front End Development Phase*, s.l.: Delft University of Technology.
19. Wang, Y. R. & Gibson, G. E. 2008. A Study of Pre project Planning & Project Success Using Ann & Regression Models. *Proc The 25th International Symposium on Automation and Robotics in Construction*, Vilnius, Institute of Internet and Intelligent Technologies, pp. 688-696.
20. Dumont, P. R., Gibson, G. E. & Fish, J. R. 1997. Scope Management Using Project Definition Rating Index. *Journal of Management in Engineering*, 13(5), pp. 54-60.