ASSESSMENT OF PLANNING, SCHEDULING AND RESOURCE MANAGEMENT TECHNIQUE FOR RESIDENTIAL PROJECTS IN AHMEDABAD

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Abstract— Project management is a process of planning organizing and managing activities and resources to accomplish a defined objective within constraints on time resource or cost. It is very common to see project failing to achieve its mission within specified time and cost. The factors contributing to overrun are inadequate project formation, poor planning for implementation and lack project management during project execution but the main cause of failure can be attributed to cost estimation failure and management failure. Project controlling uses the data from monitor activity to bring actual performance to planned performance. The present study deals with the project monitoring process of three different sites which are constructed in the Ahmedabad, Gujarat. A comparison between the planned progress of construction work and actual progress is performed in this study using project management software.

Index Terms— Planning, Organizing Resource Monitoring process, Risk Management, Qualitative analysis, Quantitative Analysis

I. INTRODUCTION (HEADING 1)

Construction is one of the biggest industries in the world today and it employs individuals from various disciplines and backgrounds. Depending on the size of the project, whether it be an office building or a skyscraper; thousands of people may be involved, which obviously requires a quite a bit of planning Project management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, and quality and participation satisfaction. The basic ingredients for a project management framework may be represented schematically in Figure. The working knowledge of general management and familiarity with the special knowledge domain related to the project are indispensable. Supporting disciplines such as computer science and decision science may also play an important role. Modern management practices and various special knowledge domains have absorbed various techniques which were once identified only with the supporting disciplines. Similarly, many operations research techniques such as linear programming and network analysis are now widely used in many knowledge or application domains. Figure 1 reflects the sources from which the project management framework evolves. A project is a finite endeavor (having specific start and completion dates) undertaken to create a unique product or service which brings about beneficial change or added value. These finite characteristics of project stand in sharp contrast to processes, or operations, which are permanent or semi-permanent functional work to repetitively produce the same product or service. In practice, the management of these two systems is often found to be quite different and as such requires the development of distinct technical skills and the adoption of separate management philosophy, which is the subject of this article.

The primary challenge of project management is to achieve all of the project goals and objectives while honoring the project constraints. Typical constraints are scope, time and budget. The secondary – and more ambitious – challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives. A project is a carefully defined set of activities that use resources (money, people, material, energy, space, provisions, communications, motivation, etc.) to achieve the project goals and objectives.

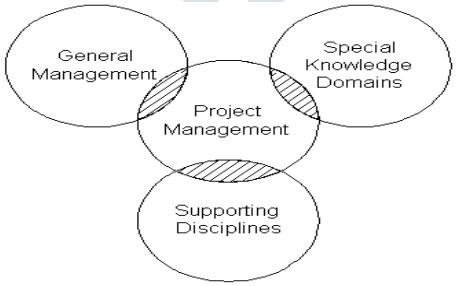

Figure 1Basic Ingredients in Project Management

The general methodology of this study relies largely on the survey questionnaire which was collected from the building contractors of different sizes by mail and by personnel meeting. The procedure of taking a project from inception to completion, and then into use is a complex one that entails time consuming design and production processes Some of the practiced associated with construction are poor quality of work, premature failure of the facility, a lack of safety, poor or incorrect design, and financial risks

II. NEED OF STUDY

Construction industry is the one of the largest industry in India, the growth of this industry is at peak level across the nation. India need planning for economic development, land use and environment planning to compare with the status of development in foreign countries. The time available to achieve this goal is shrinking. Here arises the need for effective project management. Many issues are being faced

by construction industry that must be taken care of. They include time and cost overruns due to inadequate project formulation, poor planning for implementation, lack of proper contract planning and management and lack of proper management during execution.

It has been estimated by analysis that average cost of a project goes up by 10-12 percentage compared to the budgeted cost. Observations show that proper skillful management is imperative for the timely completion of the project within estimated budget and with allocated resources. Project monitoring software is now available in market and it is very useful in the proper planning of project

III. SOCPE OF STUDY

1. Due to time limitation, this research is concerned with building project only and will not take into account that other categories of construction industry like heavy engineering construction (tunnels, brides, dams, etc.), industrial projects (factories and workshops), and infrastructure projects (Sewage and water supply).
2. Study is done only for contractors
3. This study is limited to one type of contracts, which is Lump-Sum contracts
4. To study the current practices of planning, scheduling and integrated resource management being practiced by contractors involved in residential real estate project

The assessment done with the help of the discussions with the professionals and with the help of the literature study done.

IV. STRUCTURE OF THE INTERVIEW

The interview was conducted with the project manager, planning managers, senior engineers of contractor's team having the experience of 1-10 years. This is because aim of survey is to get the techniques practiced in industry listed above. And this acquired by interviewing people having experience and skill in the same field. Now, the data was collected and mode method is used to get resultant response from the samples of questionnaire interviewed. For case study, Data analysis was undertaken using this method.

Relative Importance Index (RII) Method

Relative Importance Index method helps to determine the relative importance of the various factors affecting Planning, scheduling and resource management technique in major construction firms. The three-point scale ranging from 1 (less important) to 3 (highly Important) is adopted and it is transformed to relative importance indices (RII) for each factor as follows in equation 3.1:

$$\mathbf{RII} = \Sigma w/A*N \quad \ldots\ldots\ldots\ldots (3.1)$$

Where:
W is the weight given to each factor by the respondents and ranges from 1 to 3
A = the highest weight = 3
N = the total number of respondents

Questions	frequency	%of Responses
What is the Planning technique used?		
a) Work breakdown structure	7	20.00%
b) Bar chart	24	68.57%
c) Network Diagram	6	17.14%
Who consists of the planning of project?		
a) Project Level	5	14.29%
b) Corporate level	3	8.57%
c) Both	27	77.14%
What are different components of planning practiced in industry		
a) Objectives / Needs Project Identification	16	45.71%
b) Preliminary Project formulation Project feasibility study	14	40.00%
c) Project implementation management plan Project tendering & ordering	25	71.43%
d) Project monitoring & control Project Evaluation	28	80.00%
e) Project Re plan	4	11.43%
Is there a clear, consistent definition of success?		
a) Completion within estimated time	28	80.00%
b) Completion within estimated budget	26	74.29%
c) Completion with excellent Quality	21	60.00%
Which is the most preferable method of Estimate at planning stage practiced in industry?		
a) Rough estimate	6	17.14%
b) Detailed estimate	29	82.86%

When does the understanding about the project execution strategy become clear and consistent?		
a) Planning stage	18	51.43%
b) Scheduling stage	9	25.71%
c) Execution stage	8	22.86%
Which is the most practiced strategy to manage contingencies?		
a) Dummy activity with dummy time and cost	7	20.00%
b) Proportionate distribution of risk	23	65.71%
Which is the dispute resolution method used?		
a) Arbitration	12	34.29%
b) Conciliation	9	25.71%
c) Mediation	13	37.14%
d) Law suit	1	2.86%
What is the type of organization structure?		
a) Matrix	27	77.14%
b) Functional	8	22.86%
Scheduling team consist of-		
a) project level	9	25.71%
b) Corporate level	24	68.57%
Claims and change management		
a) Periodical	5	14.29%
b) As an when required	19	54.29%
c) Consolidated at end of the project	11	31.43%
How does component of labor play role in resource management practiced?		
a) constrained resource	32	91.43%
b) Infinite resource	0	0.00%
c) Infinite with incremental cost	3	8.57%
How does component of material play role in resource management practiced?		
a) constrained resource	4	11.43%
b) Infinite resource	5	14.29%
c) Infinite with incremental cost	26	74.29%

Table 1:- Frequency Analysis

	RII	**Rank**
What type of risk considered before planning? Give response as importance of these risk consideration in planning process,		
Financial Risk	0.93	1
Accidental Risk	0.90	2
Legal Risk	0.68	3
Technical Risk	0.66	4
Political Risk	0.65	5
Rate Assessment criteria for use of material, technology and equipment?		
Skilled workforce requirements	0.98	1
Construction process	0.88	2
Speed Equipment	0.73	3
Compatibility with other component	0.72	4

Structure adequacy and safety	0.69	5
Economy (Cost saving)	0.60	6
Maintenance requirement	0.59	7
Energy consumption	0.58	8
Which are the critical resources in themes of availability?		
Skilled workman	0.98	1
Material	0.89	2
Finance	0.88	3
Machinery	0.73	4
Space	0.71	5
Factors responsible for delay in work schedule.		
Resource Constrain	0.98	1
Unavailability of human resource	0.97	2
Material price escalation	0.80	6
Administrative approval	0.79	7
Unavailability of Finance	0.65	12
Financial capacity	0.88	5
Availability of required stakeholder	0.98	1
Scheduling techniques and software	0.69	11
Influence of owner	0.73	10
Poor site management and supervision	0.60	5
Financial constraints of contractor	0.58	5
Risk of uncertainty	0.72	13
Legal disputes between project participants	0.59	5
Delay in progress payments	0.89	4
Lack of experience of owner in construction projects	0.95	3
Delay in decision making	0.88	5
Inadequate contractor experience	0.73	9
Late delivery of materials	0.71	14

Table 2 - RII Analysis

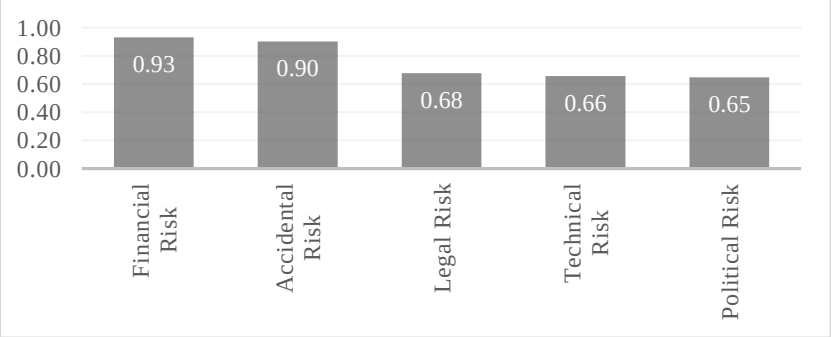

Figure 2 - Type of risk

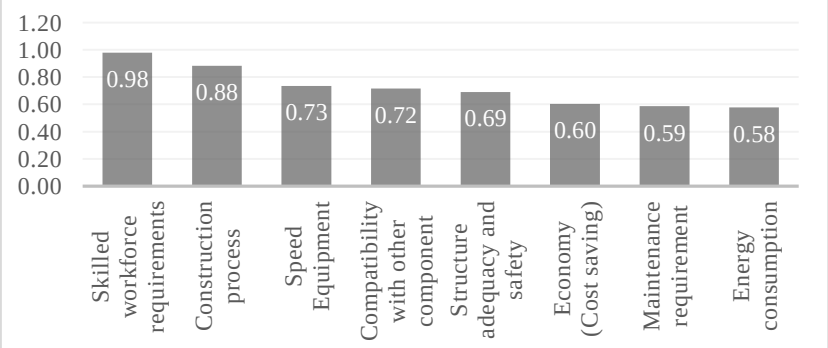

Figure 3 Assessment criteria for use of material, technology and equipment

Whereas, in frequency analysis gets percentage of responds according to their importance in industry. For case study, overall assessment of the techniques was done. How it has affected the project duration, cost and quality. Result of both the analysis says that:

- Priorities change on existing program
- Pressure to deliver project on an accelerated schedule
- Project not finishing during completion stage
- Price escalation
- Non-availability of material
- Delay in payment, handling over drawings
- Lack of upper management support

The Construction Project Management Institute focuses on nine distinct areas requiring construction project manager knowledge and attention:

1. Construction Project integration management to ensure that the various project elements are effectively coordinated.
2. Construction Project scope management to ensure that all the work required (and only the required work) is included.
3. Construction Project time management to provide an effective project schedule.
4. Construction Project cost management to identify needed resources and maintain budget control.
5. Construction Project quality management to ensure functional requirements are met.
6. Construction Project human resource management to development and effectively employ project personnel.
7. Construction Project communications management to ensure effective internal and external communications.
8. Construction Project risk management to analyze and mitigate potential risks.
9. Construction Project Procurement Management to obtain necessary resources from external sources. Construction planning is a fundamental and challenging activity in the management and execution of construction projects. It involves the choice of technology, the definition of work tasks, the estimation of the required resources and durations for individual tasks, and the identification of any interactions among the different work tasks. A good construction plan is the basis for developing the budget and the schedule for work.

It can be concluded that all the factors listed are those that have adverse effects on the construction management techniques in the Ahmedabad construction Industry, except fewer factors like location of the project, type of client, accessibility of the project, theft or poor security, cost of transportation and cost of storage that are not all that affecting construction management techniques according to the survey result.

In Risk consideration in industry majority respond to financial Risk, accidental risk, legal risk and technical risk descending. Figure 2 shows results of survey Assessment of material technology and equipment majority of respond to shortage of skilled workman and time constrain. Figure 2 shows results

V. CONCLUSION

Base on the results of the study carried out, Construction management technique is in no doubt a must use for every professionals in the construction industry. The construction management techniques however used as evident from the respondent professionals in the construction field include Gantt chart, Programmed Evaluation and Review Technique (PERT), Critical Path Method (CPM), Line of Balance, Work Breakdown Structure, PRINCE 2 , Network Analysis, Graphical Evaluation and Review Technique (GERT), Project Sensitivity Analysis, Cost Benefit Analysis and lot of others and factors such as Size of the project, Location of the project, Type of Client Source of finance , Complexity of the project, Vitality of the materials, Poor planning, Materials storage, Cost of transportation and storage and so on constitute the factors affecting construction Management Techniques in Ahmedabad.

It is however concluded that the functions of construction project management for Construction generally include the following:

1. Specification of project objectives and plans including delineation of scope,
2. Maximization of efficient resource utilization through procurement of labor, materials and equipment according to the prescribed schedule and plan.
3. Implementation of various operations through proper coordination and control of planning, design, estimating, contracting and construction in the entire process.
4. Development of effective communications and mechanisms for resolving conflicts among the various participants.

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