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A Review of Optimization Cost in Infrastructure Construction by Improving Construction Methods

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Abstract: ***In the construction projects, cost and time are the main aspects to be considered in the planning of every project. It is a difficult task used by project managers in practice, which include evaluation of plans, corrective actions and constantly measuring progress should be taken whenever required. Cost optimization is an important issue in construction project management. It is mostly used by contractors and needs to carry out throughout the life of a construction project. The availability of qualified expertise is the main problem faced by contractor in optimizing the costs on site. The duration of the project and ever changing environment are the least problem faced by contractor in optimizing the costs on site.***
Keywords: Optimization, Project, management, Cost.

I. INTRODUCTION

Large scale development activities are taking place in Indian construction industry and it has assumed the proportion and responsibilities of a big business and is closely associated with nation's economy. A large number of building projects and new infrastructures are being built on a great scale which contributes to the economic growth of country. Apart from the economy aspect, the speed with which construction is carried out is also an important factor. Like other countries, India is also facing a serious issue of time and cost overruns in construction projects. The unfortunate part is that very few projects get delivered in time and on cost. Time and cost overruns have become the hallmark of construction projects in India. However, the magnitude and causes behind these time and cost overruns remain understudied.

Control of cost and time in a construction project is one of the most important issues in construction since the emergence of the industry. In this light, a successful project should not only meet quality output standards, but also time and budget objectives. Time and cost performance is a fundamental criterion for the success of any project. However, delay of project completion is very common in the construction industry due to ineffective cost and time control. The essence of cost and time control is to ensure that projects are finished on time and this is attainable through constant measurement of progress, evaluation of plans and taking appropriate action on the project.

II. LITERATURE REVIEW

Mr. Umesh Kamble and Prof. Shashank U. Vanakudari, (2018) Project management is main stream which overall makes a civil industry worth into existence in accordance with the control on constraints such as time and cost. This paper will mainly help out to investigate the behavioural improvements in time according to the relative cost. Microsoft project software is used to enhance the scheduling adding Crashing, Slack time and alternative building material to the work planning activity. Crashing makes a proper inventory behavioural time benefits from the overtime of huge workforce and improvement in the duration of an activity using slack time in software. An alteration with the cost is maintained which helpful in retrogression of overall costs of the project. This project is very much applicable where the time and cost is the major constraint which makes a building more economical. As we had reduced the overall cost by 6.98 % and the overall duration by 7.71 %. This project concludes that any relative construction project mainly depends on the Time and Cost constraints which give a proper economical weight age to any project.

Mr.Bhushan V and Tatar and Prof.Rahul S.Patil, (2017) In the field of Construction, the important objective of every project is to complete the scope of work on time, within the budget and the quality. Time and cost trade off are the two important factors in every construction project which are crucial in achieving the project objectives. There is always a relationship between time and cost. Optimizing the time & cost is necessary in order to find out the optimum project duration corresponding to the minimum total cost and this can be achieved with the help of reducing the duration of critical activities in the network in order to minimize the overall project duration. Over the last several years, variety of methods for time and cost optimization was developed with the objective of minimizing the project cost and duration. However, existing methods ignored the effect of total float consumption resulting from decrease in duration with an increased in cost. Time & Cost trade off techniques result in reducing the available total float for non-critical activities and thus reduce the schedule flexibility.

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Nitesh Dogne And Ashish Choudhary, (2014) The paper deals with an introduction and implementation of super performing building materials and techniques all in terms of energy saving efficiency of the material, cost efficiency, application feasibility, availability, vernacular characteristics, life span, etc. A material is considered smart only when it contributes something to upgrade the quality of building. With all those advancements in construction techniques and also with the demand of end users for the smart buildings we as constructors and designers are ought to introduce something new and smart to fulfill their demands and needs. Smart structures and material technologies are a tool for sharing the knowledge of how various building materials can significantly increase production and profit using advanced communication, collaboration and management technologies. The paper provides an overview of the types of materials available giving a new insight into innovative methods and techniques that will be available, and open new doors for advancement and improvement in the construction industry. The new materials discussed in this paper present a small fraction of the options that are available for use by industry.

Ashwini Arun Salunkhe and Rahul S. Patil, (2014) The time and cost for performance of a project are usually important to the employer and contractor. About 57% of Indian construction projects are experiencing time overrun. These time overruns always contributed as expensive to all parties. This paper highlights the types of construction delays due to which project suffer time and cost overrun. Construction delay is considered to be one of the recurring problems in the construction industry and it has an adverse effect on project success in terms of time, cost and quality. The construction industry is the tool through which a society achieves its goal of urban and rural development. It is one of the sectors that provides important ingredient for the development of an economy. This paper studies external and internal factors that influence the construction process and outlines the effect of delay in large construction projects. Various media reports shows incidents of extended delays and extensive cost overruns in infrastructure projects. These delayed projects are further can conclude additional delays and this affects an ongoing projects and also new projects which could not be started due to pending projects whose completion date already elongated. Realizing the density of matter this paper studies the performance of previous year 2012 ongoing and also completed projects. These projects are from around 17 various central sectors costing Rs. 1000 crore and above.

S. Shanmugapriya1, Dr. K. Subramanian (2013) Time overruns and Cost overruns has been a major issue in many Indian construction projects. The successful execution of construction projects and keeping them within prescribed schedule and cost is very important for effective time performance and cost performance. This research work is carried out on studying significant factors causing Time overruns and Cost overruns in Indian construction projects. A valid questionnaire for the survey was developed based on factors for time overruns and factors for cost overruns identified from literature review. These factors are grouped into 12 categories for time overruns and 8 categories for cost overruns and distributed to Contractors, Consultants, and Owners of Indian construction Industry. The data from the questionnaire was analyzed statistically. Relative important index method was used to found out the most significant factors affecting Time and Cost overruns. The result accomplished from the survey revealed that the major cause for time overruns are material market rate, contract modification, and high level of quality requirement and the major cause for cost overruns are high transportation cost, change in material specification, and escalation of materials price.

III. METHODOLOGY

A. Construction Time

Activity durations frequently are tied directly to the resources applied (e.g., crew size and equipment) and the productivity of these resources. Time estimation may be important for many reasons:

1) To calculate the project completion date, with which the contractor has to make sure his or her schedule meets the date specified in the contract;
2) To calculate the start or end of a specific activity;
3) To improve work efficiency and to resolve delay claims, etc.

B. Construction Cost

The estimated cost for a contract to carry out the work is known as the construction cost and is composed of the direct cost of carrying out the work and the indirect cost (site overhead) the construction cost then forms the basis for determining the net cost for the contract. Cost is considered to be a common parameter of resources expenditure on a project.

1) The Direct Cost
2) The Indirect Cost

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IV. CONCLUSION

In the construction project, time and cost are the most important factors to be considered in the planning of every project. The aim of project is to finish the projects on time, within budget and to achieve other project objectives, From the different site study the cost optimization is the problem on the is actually the lack of knowledge and inadequate planning for the implementation coupled with the poor management of construction resources. The result accomplished from the survey revealed that the major cause for time overruns are contract modification, material market rate, and high level of quality requirement and the major cause for cost overruns are , change in material specification, high transportation cost, and escalation of materials price.

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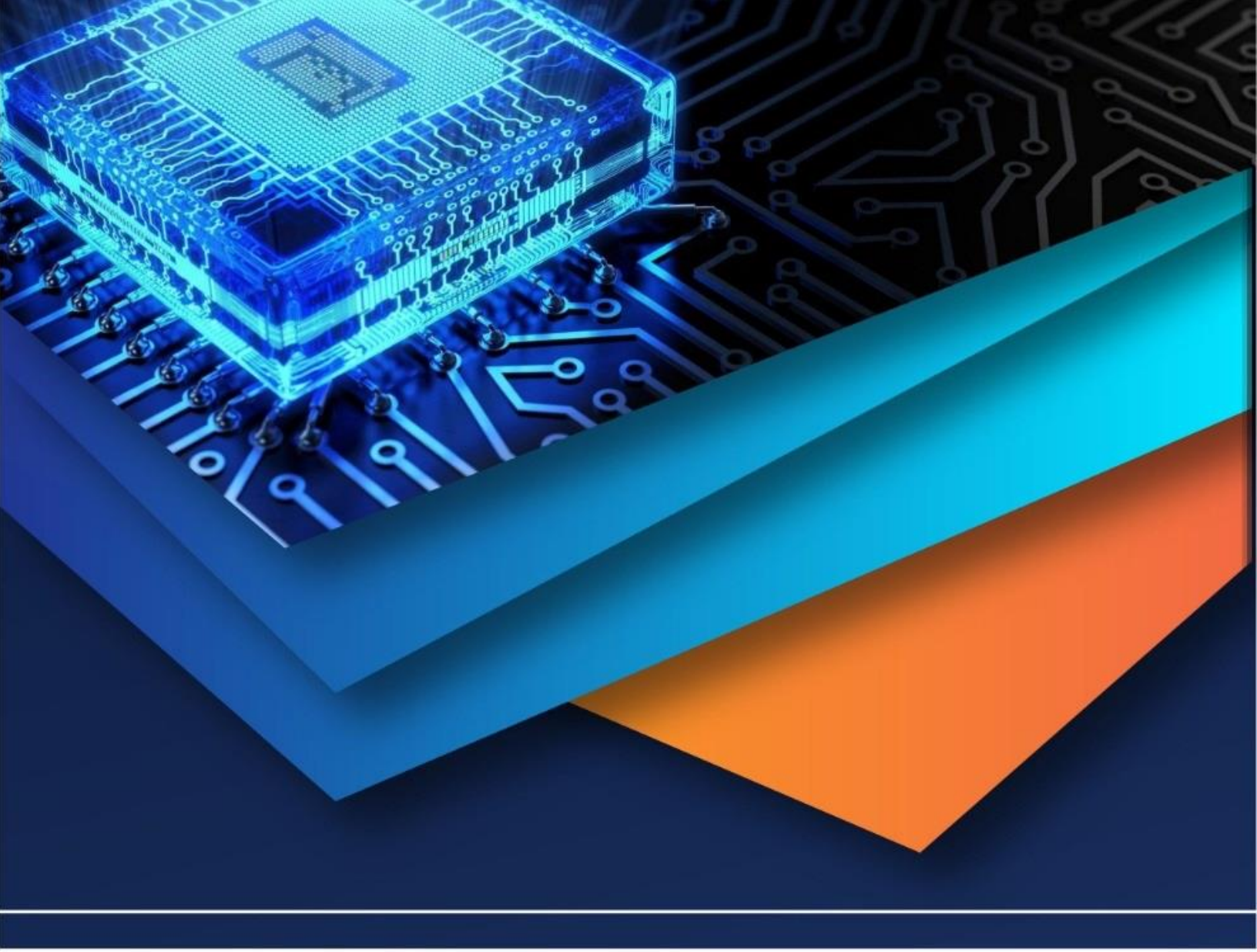

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