

Monitoring & Scheduling of a Metro Project (Bhopal) Work Using Project Management Tool Primavera P6 : A Review

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ABSTRACT

Article Info

Volume 5, Issue 3

Page Number: 162-169

Publication Issue :

May-June-2021

Article History

Accepted : 10 June 2021

Published : 25 June 2021

Arranging and Scheduling are the fundamental in the enormous foundation project like street and extension development, Metro rail projects as these are proposed for public government assistance. These activities are have various partners and enormous measure of cash, assets are contributed. Ill-advised arranging and booking prompts loss of assets, expansion in project cost and terrible postponements. Yet, because of the PC and programming advancement, it now conceivable to design these tasks utilizing programming resembles Primavera P6 and Microsoft office project.

This paper manages show review of literatures related to projet management of constructional project.

Keywords : Primavera P6 Web, Bhopal Metro, Planning, Scheduling, Monitoring and Tracking

I. INTRODUCTION

Venture burns-through a few assets in the course of its life to accomplish the ideal objective. The assets have time reliant, immediate or aberrant costs identified with them. For huge Construction projects with tremendous spending plan; it turns out to be hard for the venture group to deal with the assignments So, it turns out to be important to give an apparatus in the hand of undertaking group that helps monitor exercises in the task. Primavera Project Planner P6, an item from Oracle is an extremely amazing asset present in the possession of task group. The product helps in arranging, planning and controlling of tasks effectively. Workers for hire in India are hesitant to utilize project arranging and

planning methods, which are being utilized world over and right now demonstrated as benchmark for in time consummation of ventures. The investigation incorporates with conversation/presentation on Primavera P6 a venture arranging and planning instrument accessible. The nature of timetable produced from the product regularly needs detail and the motivation behind the product in increasing the value of the task is for the most part not met by the clients in India.

Monetary vulnerabilities lead to spontaneous construction misfortune in any immense task. Such misfortunes can be guaranteed because of surpassing the dead line of the undertakings, or now and again because of total administration and might be a catastrophic event like avalanche or tremor of flood

or any man made dangers specifically burglary, theft or quake because of mining.

II. LITERATURE REVIEW

T. Siva Nagaraju and Sri Lakshmana Kumar (2016) the primary objective of the research was to present the role of scheduling and proper usage resources to timely completion of a construction project. This objective was achieved through methodologies involved in scheduling and resources allocation. The case study proved to be a guideline in understanding the progress of metro rail station construction work and also to identify the specific problems arising during the process.

Results of the research stated the drawbacks of the present project management system in station work project and the importance efficient planning, as well as the need and effectiveness of a project management software like Primavera P6 in a construction project.

The reasons identified in delay of project of the case study were Lack of knowledge about advanced tracking methods and software's. Insufficiently skilled staff and Lack of proper fund flow throughout the project progress. A major portion of labour force was from West Bengal and Orissa. Regional festivals in these areas cause sudden delays in work progress. Even though delay due to monsoon rain was already accounted in the baseline schedule, unexpected extension of monsoon caused further delay in project progress. Sand unavailability due to legal restrictions and late delivery of resources.

Mohammad Afzal S. Siddiqui and Abhijit N. Bhirud (2018) the research paper listed the activities of Pune metro rail bridge work for a 10km stretch of bridge work and highlights the enterprise project structure, organizational breakdown structure, the work breakdown structure and its activities and thus

highlight the impact of Primavera P6 in the planning of projects of greater magnitude.

The results stated that the route from the Pimpri chinchwad to the Range hill section was planned in Primavera in the research paper which was based on tentative times of activities depending upon their working times required for each activity to finish. This is an estimated time required to complete the project not considering the other major causes of delay which can include political obstacles, non-cooperation of other departments on site utility obstacles etc. The research demonstrated the planning for a stretch of 10.8 km of metro rail bridge from the PCMC to range hills up to the substructure level activities. The various practices of getting formalities done for superstructure works have also being taken into account. This scheduling has future scope of updating and monitoring the scheduled work.

R.Santhosh Kumar and Anoop James Antony (2018) the primary objective of the research was to complete the construction project as indicated time period with specified date and proper usage of funding and number of resources. To accomplish the project successfully, the objective included preplanning and scheduling the activities of a project for acquiring budgeted cost, adopt the proper activity sequencing by assigning proper relationship between activities, identifying the activities which could be start parallel so that the duration could be reduced, allocate the resources effectively for usage of available equipment's and material's. With all projects are in a centralized database, the robust security module protects project data and offers flexibility when determining who can access each project. CPM Scheduling provides Critical Path Method (CPM) Scheduling, which uses the activity durations, relationships between activities and calendars to calculate a schedule for the project. CPM identifies the critical path of activities, those activities that

affect the completion date for the project or an intermediate deadline, and if delayed will delay the finish of the project.

Conclusion derived from the results stated that the preplanning and scheduling by using Primavera P6 helps in understanding the variation original schedule and the pre-planned schedule. This help the project managers to identify the critical activity plan accordingly while executing the project. The current construction practice in our country is still adopting the policy of as and when required in managing the resource of project. This policy of management may cause a huge impact in achieving the budgeted expenses and the actual expenses. Hence using construction management software in the vast and complex projects reduce the uncertainty and achieve a better result.

Abdul Aziz and Sanjeet Kumar (2019) the research aimed to know difference between the manmade and primavera software, in estimation of scheduling of financial and work management of a project with the aid e.g. literature references and the unique methodology in monitoring and control with the help of primavera software. The estimated project completion time for G+4 building, Osmania University, Hyderabadis formed 560 days by the contractor, which was approximately equal to 18months, but the same project, precise planning, controlling implementation and monitoring of every activity using primavera tool the expected time of the project completion is estimated to be 486 days only. The planning of various activities throughout the project run would be optimum, then financial and work management can be done properly. The primavera software P6 is a perfect and efficient tool for the project management and for the purpose of monitoring and controlling of the various construction projects.

Akash Rajkumar Wadhwa and Dattatray Santram Shinde (2016) the research paper considered an existing building that is SGI JUNIOUR BOYS HOSTEL, ATIGRE G+5 stories and was scheduled manually and total time taken by the building was about three years .In this study, there was a need to revise the schedule and reduce the total duration of the project.

Planning, monitoring and controlling, as well as the need and effectiveness of project management software like Primavera P6 in a construction projective of this study was to understand the role of monitoring and control in the progress and timely completion of a construction project. This objective was achieved through revision of literatures and methodologies involved in monitoring and control. The case study proved to be a guideline in understanding the progress of construction work and also to identify the specific problems arising during the process. Results of this study show the drawbacks of the present project management system in running project and the importance efficient.

The comparison between the existing building data and the revised data by PRIMAVERA is going to be studied. Keeping the right activities on right track is done. An efficient and cost effective new project management plan was brought to conclusion.

Ajesh Pilaniya and Ashwin A. Mahajan (2018) the objective of the research was to present the importance of Primavera P6 Web in the complex construction projects like metro rail project. Objective of the research was achieved by enlisting and observing the advantages of P6 web over the client based version. This software proves to be efficient and adds value to a project. It is tried and tested software and certainly it improves the efficiency of overall project. It acts as excellent communication bridge between upper management and all other teams who

physically check on the progress of project. The research paper dealt with advantage and added benefits of Web based primavera P6 for planning and scheduling of Pune Metro Rail Project.

Alberto Cerezo-Narváez et. al (2020) the research paper analyzed whether the integration of a cost breakdown structure (CBS) can lead to the generation of more robust WBSs in construction projects. Over the last years, some international organizations have standardized and harmonized different cost classification systems (e.g., ISO 12006-2, ISO 81346-12, OmniClass, CoClass, UniClass). These cost databases have also been introduced into building information modeling (BIM) frameworks. We hypothesize that in BIM environments, if these CBSs are used to generate the project WBS, several advantages are gained such as sharper project definition. This enhanced project definition reduces project contradictions at both planning and execution stages, anticipates potential schedule and budget deviations, improves resource allocation, and overall it allows a better response to potential project risks. The hypothesis that the use of CBSs can generate more robust WBSs is tested by the response analysis of a questionnaire survey distributed among construction practitioners and project managers. By means of structural equation modeling (SEM), the correlation (agreement) and perception differences between two 250- respondent subsamples (technical project staff vs. project management staff).

The results stated that the WBS involves structuring the project scope in a hierarchical manner. It is oriented to the deliverables, and avoids both duplication and omission of tasks. As the project work was defined more clearly, project roles and responsibilities can be assigned to subcontractors and organizational units more easily. This, in turn, also allows to define more representative project schedules and budgets.

To conclude, future research will pursue to quantitatively measure the influence of integrating the WBSs and CBSs with the projects' actual quality, time, and cost performance. It will also be worth asking whether this integration will improve a company's knowledge and change management capabilities.

Kottamasu L. N. Panakala Rao and K. Shyam Chamberlin (2019) the principle of research on project resource allocation worn in the construction filed is to optimize or condense or to stay away beginning on wastages of the all materials in project. Resource allocation and same as resource optimization has been completed by means of project organization software similar to primavera p-6. Here labour as like man power, wood working as carpenter, unskilled labour like helper, water colourist, carpenter assistant, water colourist collaborator have been taken in to reflection for resource allocation and resource optimization for the reason that they are mostly used resources were institute as an greater than outstanding resources for a number of performance. Therefore resource optimization was complete to these resource materials and by changing the predecessors devoid of upsetting the interval of the project.

Conclusion derived from the results stated that the construction project resource allocation like to labours, unskilled labours, wood worker, collaborator, water colourist, carpenter collaborator, painter collaborator in this case revision was optimized. In such a way that they are not over outstanding of any of the activities in the project. Resource allocation as optimized can be completed devoid of changing the project period. Resource allocation as Optimization can be done to all other resources which are used in construction project and can reduce the project cost. Over allocated resource are reduced from the activities.

Chiranjeevi D S et.al (2017) the vital objective of construction group is to terminate the project as determined on record furthermore, inside the estimated with appropriate use of the considerable number of assets like labour, money, materials and equipment, and furthermore to execute the project with quality. To accomplish the above, planning was fundamental. Planning is done to finish the project on time and financial profit and study primavera p6 software and to use the same for the execution of the on-going project. An

analysis on cost, schedule, monitor & tracking of a project by using primavera p6, work progress will be estimated based on the baseline created and proper input should be given to management to take a strict action against completion of work on time, data etc.

Conclusion stated that the Earn value management is a program evaluation approach which is evaluated and tracks a project in better manner. This project report indicates significance, execution and particular components of earned value management that advantages extend director & eventually brings about project achievement. The project is tracked on 3 durations from 1-June-2015 to 1-Jan-2016, 1-Jan-2016 to 1-Aug-2016 and 1-Aug-2016 to 4-Apr-2017 in all that we obtained Plan Value (PV), Earn Value (EV) & Actual Cost (AC) from these 3 basic specification the Earned Value Performance measurement indices obtained. The Earned Value Performance index shows the performance of a project. Cost performing 88% (CPI 0.88) as budgeted cost stating that the project cost is overrunning. So as to complete project on scheduled time the project has to perform in 1.02% speed of planned value.

Akshay R. Kohli (2017) the primary objective behind the research was to identify construction sequence for building construction and even identify technique used in developing planning and scheduling. The

scheduled model was prepared using Primavera Software so as to identify proper execution of the planning and scheduling. Such process is used to investigate defects in the planning and scheduling procedure of the organization, and suggest suitable improvements in their methods.

Conclusion stated that the research provided in depth analysis of project management on Primavera P6 EPPM software and explained all aspects associated with it. The methodology to carry out construction management of the building has been explained with respect to planning, scheduling and resource allocation and levelling. The concepts of budget optimization and updating have been understood and the project has been completed in an efficient manner.

Samad M. E. Sepasgozar et.al (2019) the research paper aimed to identify the most relevant papers of delay causes and effects and to develop the DEC database for future critical analysis. The content of the DEC dataset was systematically analysed using

bibliographic, cluster, and thematic analyses. This paper presented the DEC literature, including key findings of delay over the years. This study carefully conducted a systematic content analysis, resulting in four main overlooked factors and deficiency areas, which should be addressed in the future studies. The four factors are faulty data analysis and interpretations due to small samples of participants or low data reliability, unmatched structure of research questionnaires with the current policies or standards, overlooking the effects of technology adoption by construction stakeholders, and ignoring jobsite upgraded equipment. The key deficiencies were identified as faulty of data analysis and interpretations due to small sample of participants or low data reliability, unmatched structure of research questionnaires with the current policies or standards, overlooking the effects of technology adoption by

construction stakeholders, and ignoring jobsite upgraded equipment. The overlooked factor refers to the data and the lack of evaluating new technologies in delay analysis. For example, OF1 refers to the quality of data collected from questionnaires, which cannot be generalized as a valid finding of critical factors of construction projects all over the world. In fact, a major part of the DEC dataset focuses on developing countries. This small dataset cannot represent all key practitioners with a real understanding of the delay causes and effects. Some studies recruited a limited number of respondents (less than 150), which cannot represent all projects of a country.

In some cases, the survey participants were selected carefully, and in some cases, they were supposed to be selected randomly, but in reality, it is not clear what their strategy of randomness was. Some studies used AHP questionnaires to provide a consistency ratio to increase the reliability of the findings, but these studies suffer from a limited number of factors measured and a limited number of participants.

Piyush Pramod Bagde and Abhijit N. Bhirud (2018) the research paper considered a bridge project site located in town named Bhandara, Maharashtra on National Highway No. 6. There are more than 50 activities which give the complete clarity of planning of a project.

Conclusion derived from the results stated that Primavera P6 software was used to analyze the project planning in more accurate manner. Finding obstacles in planning is possible

only when activities are clear and are in very detailed. Because of web assess a same project can operated from multiple users from any location of world. The security can be maintained by providing login id and password. Control over the cost, management of time,

management of working hours, update and monitoring carried out in a proper manner. Paper less project management at site can be done. Comparing multiple project at a same time can be done in primavera very easily at a same window. Proper resource optimization is possible during levelling of resources based on required conditions and constraints.

Anurag Mahure and Amitkumar Ranit (2018) the primary objectives of the research was to plan, schedule, and track a residential project with help of primavera software, study the results generated, it was possible to suggest which method is suitable for the selected residential project. Project Monitoring acts like a warning mechanism; it is the process of recording, collecting and reporting information regarding project performance that the project manager and others wish to know. Monitoring includes watching the progress of the project against time, performance schedule and resources during actual execution of the project and it identified the lagging areas which require timely attention and actions. It is very common to see project failing to achieve their missions within specified time and budget, the factors causing overrun as stated above inadequate project formulation, poor planning and lack of project management during execution, but the main cause of failure can be attributed to cost estimation failure and management failure. Large projects become more complex and the ability to exchange information on paper within organization on a timely basis gets difficult. Project management software is a process which involves estimation, Rate analysis, sequencing the activities, resources calculation & allocation and allocating duration & relationship. The construction scheduling was to complete the project in time and equal the resources with the allocated time.

The results stated the drawbacks of the present project management system in running project and the importance efficient. An efficient and cost effective new project management plan was brought to conclusion.

Anurag Mahure and Amitkumar Ranit (2018) the research paper presented analysis of Construction of 200 Trainee hostel building in campus of Dr. Panjabrao Deshmukh

prabodhini, Amravati with a contract period of 24 months. The contract value of the project was Rs. 11.96 crores where the nature of contract was item rate contract and the project Client was Public Works Department. It was observed that after planning and scheduling using Primavera the time duration was reduced by nearly 3 months. Hence after careful studying this software one can control the project in terms of duration hence leading to cost optimization.

Planning, monitoring and controlling, as well as the need and effectiveness of project management software like Primavera P6 in a construction project of this study was to understand the role of monitoring and control in the progress and timely completion of a construction project. This objective was achieved through revision of literatures and methodologies involved in monitoring and control. The research proved to be a guideline in understanding the progress of construction work and also to identify the specific problems arising during the process. Results of this research stated the drawbacks of the present project management system in running project. An efficient and cost effective new project management plan was brought to conclusion.

Arindam Debnath et.al (2017) the primary objective of the research was to guarantee that the top request choices are made in view of accessible site information and arranging and show where

enhancements should be made. So as to decrease the length of the venture by applying appropriate exercises and assets time to time and examine the venture delay by legitimate following of the work on regular schedule.

The outcome was inferred that the Activity ID and Activity Description both the most unused part can enormously upgrade the nature of the timetable if utilized legitimately. It was the obligation of the arranging group to precisely choose the Activity ID structure ahead of time in this way, that timetable planning streams easily with no contentions. Thus all the necessary factors with respect to risk management in metro rail projects has been formulated and questionnaire has been designed and the questionnaire will be distributed to the corresponding persons who are working in metro rail projects and by making use of software the response collected from the distributed questionnaire will be analyzed and appropriate suggestion and recommendations are made. The activities of the project was done by using primavera which describe easily each of activity of the project. Analyzing the input data of the project and reporting the output data by which the ability for comparison between the original plan of the project and the required date of the project was performed.

III. CONCLUSION

Authors present resource allocation using management application Primavera P6 or Microsoft Project but no one explained allocation of resources using IS 7272 provisions.

Authors presented scheduling of a residential or commercial live project but least research was presented on railway metro Bhopal

In past, researchers explained the importance of risk analysis in construction projects whereas project analysis in numerous activities was considered.

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Cite this article as :

Amit Namdeo, Ravindra Kumar Raj, "Monitoring & Scheduling of a Metro Project (Bhopal) Work Using Project Management Tool Primavera P6 : A Review", International Journal of Scientific Research in Civil Engineering (IJSRCE), ISSN : 2456-6667, Volume 5 Issue 3, pp. 162-169, May-June 2021. URL : <https://ijsrce.com/IJSRCE215327>