

Scheduling and Monitoring of Water Supply Project at Jabalpur using Management Tool Primavera : A Review

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ABSTRACT

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Implementation of construction project needs a proper planning and scheduling is of vital importance for the project to be executed and run smoothly. A best schedule has to be prepared in such a way that meets the primary objectives of the total project. Those primary objectives are to create a quality project, completed on time, within budget, and in a safe work environment. IN this paper presenting review of literature related to monitoring controlling of a water supply project.

Keywords : Primavera, Gantt Chart, Time-Cost Comparison, Cpm Network, Tracking, Project Scheduling.

I. INTRODUCTION

In the developing world more than a billion people are facing a lack of safe drinking water. Approximately three billion people live without access to adequate sanitation necessary for reducing exposure to water related diseases. Poor water quality continues to be a major threat to human health. Approximate 4.1 percent of the total global burden of disease due to Diarrhea and is responsible for the 2 million people deaths of every year. Water and water resources are very important for maintaining a productive environment for all living organisms. Due to human populations and economies grow; global water demand has been increasing rapidly. Global population increase and lifestyle changes are growing pressures upon water resources leading to widespread

water stress in many countries. As a result there is urgent need to conserve water for future. Actually water influence living standard as well as health status. Water is crucial substance for all living thing not only human beings, so every decision and every step to be

Project Management

Primavera Systems, Inc. was a privately held company that developed Project Portfolio Management (PPM) software to assist project-intensive organisations in identifying, prioritising, and selecting project investments as well as planning, managing, and controlling projects and project portfolios of all sizes. Oracle Corporation became the legal owner of Primavera on January 1, 2009. Joel Koppelman and Dick Faris launched Primavera Systems, Inc. on May 1, 1983. It was a private corporation situated in Pennsylvania (USA) that developed Project Portfolio

Management software. Primavera purchased Eagle Ray Software Systems in 1999, Evolve Technologies (a professional services automation provider) in 2003, Pro Sight (an IT portfolio management software vendor) in 2006, and Pert master in the same year to help expand its product capabilities (a project risk management software vendor).

because the drainage system and water supply system are passing through the same channel in case of leakage in supply line the drainage water gets mixed and makes the water contaminated and prone to diseases. Government authority should keep eye on the status of water body so that in the future we may not made water crises.

Project Management Stages

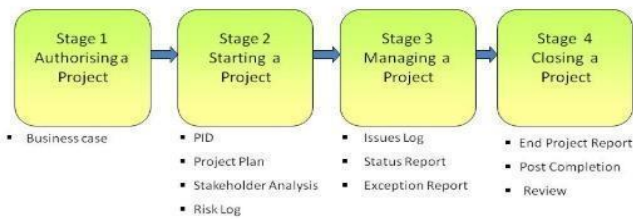


Fig 1 Stages of Project Management System

II. LITERATURE REVIEW

Archana Sen et.al (2022) objective of the research paper was to investigate the status of water resource and water supply system in Bhopal city in order to analyse the quantity and quality of water supply and further investigate the issues and challenges about water resource in the city. Area wise survey has been conducted with the help of a structured interview schedule along with purposive random sampling technique used here, from different areas of Bhopal city like slum and non-slum 42 sampling points are selected for primary survey. Sample size was 400, sample distributed in two major parts 144 slum and 256 non slum according to basis of slum and non slum household proportion.

The paper elucidates that water bodies are being polluted which needs great concern to its protection. The main problem found in quality of water of colour smell taste and also in the quantity of water. There should be different arrangement of sewage line so that sewage water will not enter in the freshwater body because it affects both aquatic as well as human life. As per the study the slum are suffering to much

Roma Silawat and Rajendra Chauhan (2021) research paper aimed to evaluate water quality of “Kaliyasot River ” for a period of one year 2018-19 in summer, monsoon and winter seasons. The samples were collected from different sampling points. The parameter detected were temperature, turbidity, pH, electrical conductivity, total solids, TDS, SS, nitrate, phosphate, chloride, alkalinity, total hardness Ca-H, Mg-H, DO, BOD, COD, K, Na , sulfate and fluoride all physico-chemical parameters.

The analytical result of different physico-chemical parameters stated that Kaliyasot river water was affected by various anthropogenic activities. Results concluded that the value of some parameters were beyond the permissible limit while some others were within the limit. The river is polluted but can be used for irrigation purpose.

Balakrishna Ch et.al (2021) The research examined timetable delays in the development of a multistory residential complex and identified the elements and people responsible for the delays. The schedule delay analysis was undertaken using various features and capabilities of Primavera software, and an alternate schedule was established with more resources and time to lessen the effect of delays, which would be beneficial to the contractor and all other parties engaged in the project.

According to the results, the project's updated length after completion was 705 days. Because constraints were not properly applied to key operations, some activities were delayed. The contractor was found to be the source of delays due to a variety of causes. Four

of the 15 factors were found to be excusable, while the others caused key processes to be delayed. The project's duration was split after the proposed timeline was implemented. The process took 705 days to complete, whereas the intended schedule was just 660 days long.

Gunjal Kartikeyan et.al (2021) The goal of the study was to save time and cost by balancing resources, which was accomplished by comparing the optimal results in three scenarios. In Case 1, the entire project was assumed to be completed in the same WBS sequence without being broken down into pieces, and the cost incurred by resource consumption was estimated. In Case 2, the entire project was split into two sections, and the cost of resource consumption was estimated. In Case 3, the entire project was split into three halves, and the cost of resource consumption was estimated.

Determine project team roles and procedures for resolving project conflicts. For scheduling and budget management, plan and estimate % completion. Determine how to compress or recover time in your timetable. Develop risk management plans and procedures for budget and scheduling estimates, as well as a resource histogram and resource balance to perform earned value analysis on a project plan that is being actively tracked.

Nidhi Raghuwanshi and M. C. Paliwal (2021) The research report compared the two different blocks, Block A and Block B, in the AwasYojna project presentation in New Market Bhopal. The project articulated the advantages and added benefits of web-based Primavera P6 for planning and scheduling of structures under development under the government programme "AwasYojna," framing the challenges and complications encountered in the construction time frame and resource availability.

Results stated the drawbacks which ultimately became the reasons for delay of the project and

compared the schedule of the two blocks of PMAY Urban. The process of preconstruction was managed equally by linking all such activities namely preparing site office, Labour room, and laboratory setup. By linking the activities, the time lapse reduces simultaneously.

Sudarshan. S and Geena George (2021) The purpose of this study paper was to compare the efficiency of two different software programmes, Primavera P6 and MSP, in building projects. Primavera P6 software was used to manage the project's planning, scheduling, and tracking. The Primavera P6 software can efficiently distribute several organisational initiatives. P6 software was shown to be useful in resource flattening and resource levelling procedures in research. Primavera P6 software was more effective, took less time, and required less administration than the traditional way.

Earned value analysis revealed that the project cost was increased due to unanticipated increases in labour and material costs. By using project management techniques such as rapid tracking and activity duration crashing, the extra cost invested can be recovered in subsequent activities. Using project management approaches and rescheduling the project, the remaining activities were cut in length.

A.A.Lakade et.al (2020) the primary objective of the research paper was to investigate ERP which is SAP-Systematic Application Product and its implementation in different phases and understand their benefits in civil industry. Integration of ERP and PRIMAVERA was done for project management due to their infinite benefits as a project management tool. While considering ERP, it was found to be a single unified database which helps to access data from any department and by using material management module of ERP, the problem related to material management on site can be tackled and In case of PRIMAVERA, it was found that its features helps for

doing resource levelling, scheduling and even reports can be generated . An integration was done of both the softwares then there was flow of data which will help to increase efficiency and cost effective project management can be done.

Divya V S and C Gayathri (2020) The study's main goal was to use the approaches "Resource allocation, Resource levelling, and time cost trade off" to maximise resources. Resource allocation was utilised to efficiently distribute available resources. The scheduling of activities and the resources required by those activities, while taking into account both resource availability and project time, was known as resource allocation. The goal of resource levelling was to reduce resource loading fluctuation over time. Redistribution and imbalance of assigned tasks are part of resource levelling. The goal of resource levelling strategies was to improve the form of the resource histogram by eliminating variation. The critical path technique was utilised to schedule a series of project activities, and Primavera software was used to analyse resources.

The entire estimated building cost was Rs. 5609600.87, and the twin home construction timetable was 167 days, according to the conclusion. The project was estimated to be completed in 140 days, thus the critical path technique and primavera were accomplished in that time.

Selva Kumar M and Manishankar S (2020) The Primavera Software makes it simple to make judgments while executing any project. Individual work costs can be estimated rather accurately based on length. According to our estimate, it is possible that the construction, which began in September 2018, will be completed. According to the typical schedule, the project will take 730 days to complete. Following up until April 2020, the assignment's overall fulfilment is 20.00 percent, with 9.96 percent of road works completed, 34.18 percent structure

work completed, and 0.78 percent of varied positions completed.

The straight visit identifies the reasons for deferring my work and predicts an unpleasant date for the task's completion. Granting Permission for Isolating Soil from Cart Location, Physical Responsibility for Undertaking Site/Land Obtaining, Issuance of NOC by PWD/WRO, Govt. of Tamil Nadu, Shifting of Utilities, Cyclone "GAJA"/Rain, and Corona Pandemic COVID-19 are the monumental reasons for deferrals in our road adventure. The temporary labourer has announced a revised progression plan based on the arrangement's terms and a 364-day increase in soliciting time. The new development strategy has nothing to do with the previously approved base schedule.

K.Priya et.al (2019) The goal of the study was to use STAAD.Pro and Primavera P6 software to analyse and schedule the construction of an apartment complex (G+13). The planning was carried out using AutoCAD in accordance with the IS 456-2000 regulation. The first and most important benefit of effectively planning in Primavera is a project start date of 11 March 2019 and a completion date of 16 June 2022. By assigning two relationships to each activity at a time, Primavera P6 aids in the appropriate scheduling of the project and significantly decreases float. This report clearly shows all of the crucial procedures, such as developing an EPS, creating a WBS, linking activities based on their interdependence and resource availability, and determining the critical route. Resource allocation was used to determine the project's budgeted cost, time, and materials.

The conclusion indicated that project schedule control reduces project time due to the application of limits, amount of effort, and resource dependency. The project review was carried out to provide a full picture of the project case study and to determine the discrepancy between the scheduled control and the planned control schedule. Primavera P6 software is

used for scheduling control studies on restrictions and activity kinds. Due to the application of constraints, amount of effort, and resource dependency, project schedule control reduces the duration of the project.

Kottamasu L. N et.al (2019) The goal of this study work was to use Primavera software to achieve optimal resource use and resource levelling, as well as to comprehend the value of resource management techniques. In the construction field, the principle of project resource allocation was to optimise, condense, or stay away from wastages of all materials in the project. Project management software similar to Primavera P-6 was used to accomplish resource allocation and optimization.

According to the conclusion, resource allocation can be performed without modifying the project term. Resource allocation as optimization can be applied to all other resources employed in a building project, lowering project costs and removing over-allocated resources from operations.

Md. Zishan Mallick and Mohd Zeeshan khan (2019) The planning and scheduling of a G+2 office complex was described in this research article utilising the highly traditional project scheduling software Primavera P6. Several activities and tasks were completed during the planning phase of the project, with durations given, baselines indicated, activity details, and activity start and finish dates. Primavera aids in the timely completion of projects and cost reduction. As a result, it is mostly used in the building industry. A full job sequence was completed in order to analyse the implications of the acquired data in terms of project scope and duration. Primavera assists in the planning, monitoring, scheduling, resource allocation, and time management of the project.

The software will be less time consuming and does not require any paper work; it provides detailed knowledge of project costs, time, working hours, and updates; it aids in better project tracking by identifying critical activities that should be given

special attention to avoid project delays; and it reduces labour costs by up to 5%. This analysis served as a guideline for estimating building progress. The analysis found that the current project management system had significant disadvantages over the newly designed project management system.

Shubhashree P. Deshmukh and A. B. Ranit (2019) The research paper presented a comparison of scheduling in MS Project and Primavera, as well as defects in the organization's planning and scheduling procedure, and suggested appropriate improvements in their methods, as well as the utility of PRIMAVERA and MS Project in the project's construction and execution.

According to the results, project studies aid in understanding the present status of project scheduling theory, project processes, and commercial scheduling software usage. MS Project and Primavera features and functions are recognised, and the practical durations necessary to complete activities are determined. Scheduling has been built using Microsoft Project and Primavera, and flaws in the organization's planning and scheduling procedures have been investigated.

V.S. Divya (2019) The goal of the study was to use the approaches "Resource allocation, Resource levelling, and time cost trade off" to optimise the resources. Resource allocation was utilised to efficiently distribute available resources. The scheduling of activities and the resources required by those activities, while taking into account both resource availability and project time, was known as resource allocation. Resource levelling tries to reduce resource loading fluctuation over time. Redistribution and imbalance of assigned tasks are part of resource levelling. Techniques for improving the form of the resource histogram by decreasing fluctuations were being developed. By allocating more resources to

project activities, the time cost trade of project duration can be lowered.

Flexible scheduling improves the outcomes from CPM and the existing strategies utilised to improve its schedules, according to the findings. Different objectives, such as resource levelling, resource allocation, and cost optimization with resource limits, were effectively solved using the approach.

Anurag Mahure and Amitkumar Ranit (2018) The study paper offered reports on the project scheduling work. The provided work was divided into two sections, the first of which dealt with data gathering and the second with analysis using Primavera P6. The initial step in data gathering was to choose a building and establish a work breakdown structure based on the construction process. Actual input offered in the software, such as wbs, activity, start date, finished date, resources, and daily updates, were explored in the second phase. A Gantt chart was created, and the outcomes were compared to the time required according to the programme.

To better understand the role of monitoring and control in the progress and timely completion of a construction project, researchers looked into planning, monitoring, and controlling, as well as the need for and effectiveness of project management software like Primavera P6 in a construction project. The research served as a guide for understanding construction progress and identifying specific issues that arose during the project. The findings of the study revealed the shortcomings of the current project management system in managing projects.

Fathima Zerine T and Angela C. Joy (2018) The goal of the study was to understand the role of monitoring and control in the progress and timely completion of a construction project, as well as the necessity for and effectiveness of project management software like Primavera P6 in a construction project. This was accomplished through revising the literature and

procedures used in monitoring and control. The study served as a roadmap for analysing construction progress and identifying specific issues that arose during the process. The findings of the study revealed the shortcomings of the current project management system in project execution. A new project management plan is completed that is both efficient and cost-effective.

Keshav Phophalia and Riddha Basu (2018) primary objective of the research was to present comparative analysis of two different project management softwares on the parameters of its efficiency and effectiveness. Microsoft Project 2016 and Primavera P6 V16.1 were compared for the investigation through survey analysis and Questionnaire survey methodology.

Results stated that the Microsoft Project proved to be the most efficient application when compared to Primavera P6 due to its ease of use and graphical representation as it holds advanced graphic tools.

Hitanshu Saini et.al (2017) A four-story building of an Ayurveda research facility in Pandoh, Mandi (H.P) was investigated in the research report. A scheduled project on Primavera P6 was watched, and the sorts of delays that occurred were studied, resulting in an increase in the project's overall duration. Primavera P6 is a project management software that allows you to collect, record, monitor, control, and report on project performance.

Water proofing and pile head treatment may be delayed as a result of the excavation delay. As a result of these delays, the project may be completed four months late. The delays can be dealt with if the Owner allots enough time and money to the design stage of the project. Contractors and consulting firms should both contribute to the schedule. To strengthen managerial and technical skills, the contractor should hire qualified work teams and give worker training. In addition, the contractor should have a project

manager on his team to monitor work progress and assure timely delivery of goods.

Nagaraj Belsur et.al (2017) The goal of this study was to look at the level of mindfulness on EVM among those working on a Metro Project in Phase 2 Reach2A with a length of 3.954 kilometres (approximately) at Bangalore Rail Corporation Limited (BMRCL). The overall goal of the planning was to improve the link between the foundation of a compelling efficiency estimation framework and the human task of improving hierarchical execution through methods for changes in all or a few components of the organisation, including the general population, structure, culture, and innovation. A Primavera programming P6 variation was used to plan and monitor this project. A project's WBS was created, and a few exercises were identified. On the basis of a review report, the term of a few exercises was reviewed, and the relationships were examined and linked to exercises that are involved in booking and checking a venture.

The limitations of the current project management system in SDF projects were discussed, as well as the need of efficient planning, monitoring, and controlling, as well as the requirement for and effectiveness of project management software such as Primavera P6 in a construction project. It was suggested that significant efforts be made to raise awareness and boost the level of EVM application among key participants in the construction industry.

Suchithra L and Anne Ligorina S (2017) Earned Value Management was used in the research paper to track and forecast the results (EVM). The relevance of construction management was discussed, as well as the tracking of current residential buildings and the administration of new apartment building construction. Using Primavera, the researchers were able to track the ongoing construction and management of a new structure. It was required to

follow the project during construction in order to control variances and to determine the project's forecasted cost. One of the most crucial instruments in building is construction planning and scheduling.

Residential Project Progress was 55.42 percent of the entire work accomplished in 68.48 percent of the total project length, according to the results. A residential project's schedule variation index was -0.17, indicating that the project was 17 percent behind schedule. The SPI of 0.83 indicates that just 83 percent of the residential project was completed as planned. When the CPI is 0.97, it means the project is only moving at 97 percent of its original pace. The project was originally scheduled to be completed in 15 months, but owing to natural disasters, a labour shortage, and a lack of funds, the timeline was extended to 3 months, giving the project an additional 18 months to finish. The cost variance for this project is Rs.89334 and the cost variance index is -.03. If the CV value is negative, the project is beyond budget. The cost of constructing an apartment complex is estimated to be Rs.8072726.

Yash Pandit et.al (2017) The project monitoring process of a ten-story (G+9) skyscraper under construction in Tathawde, Pune was the subject of this research report. Using the project management software Primavera P6, a comparison was made between the projected and actual progress of building activities. Despite well-established project monitoring concepts and policies, the process itself may not be efficiently carried out in a project due to practical issues that exist or arise. Such an attempt to understand the practical issues with project monitoring and control will aid in the effective identification of problem areas and the development of a control mechanism to correct deviations.

The results demonstrate the project management system's shortcomings, the need of efficient planning, monitoring, and controlling, as well as the need for

the usefulness of project management software such as Primavera P6 in a construction project.

T.Subramani and K.Chinnadurai (2015) By developing benchmark measures of industry norms for entire construction period utilising scheduling simulation modelling, the study paper contrasted the time performance of the conventional technique of construction for high-rise residential and the Industrial Building System (IBS) approach. Creating a healthy working environment among individuals directly involved in the building business is one of the good changes. Improved Service Delivery Efficiency: Project management provides an easy-to-follow "roadmap" that leads to project completion.

The results reveal that while not all IBS components can reduce overall construction time, incorporating IBS components can improve and expedite the construction of an 18-story residential structure from the start of the project to completion, saving 405 days or 42 percent of the time.

III. CONCLUSION

The literature summary in the section above describes the study that was done regarding resource allocation, resource levelling, time, and cost optimization. Primavera and the histogram are used to optimise these resources. Primavera software and the critical path approach are both used. Using the critical path method shortens the project's time. The author of the paper "Resource Optimization in Construction of a Residential Apartment Using Primavera P-6Software," Bhanthirithirumalesha, clearly explains how Primavera software is used in various construction projects. Resource optimization is thoroughly researched, and resource levelling and optimization are employed as an approach. The resource levelling utilising the histogram and collapsing approach was then thoroughly examined. The PRIMAVERA programme is clearly indicated in

the numerous literature reviews as being utilised to cut costs, time, and resources.

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