

# Integration Of Primavera For Smart Construction Of Water Tank

Mr. Alkesh Bhalerao<sup>1</sup>, Dhumal Vipul Vilas<sup>2</sup>, More Ronit Suhas<sup>3</sup>, Sakpal Shivam Bhagoji<sup>4</sup>, Gupta Pritesh jaiprakash<sup>5</sup>

<sup>1</sup>Asst. Professor, Department of Civil Engineering, New Horizon Institute of Technology and Management, Maharashtra, India

<sup>2</sup>B. Estudent, Department of Civil Engineering, New Horizon Institute of Technology and Management, Maharashtra, India

<sup>3</sup>B. Estudent, Department of Civil Engineering, New Horizon Institute of Technology and Management, Maharashtra, India

<sup>4</sup>B. Estudent, Department of Civil Engineering, New Horizon Institute of Technology and Management, Maharashtra, India

<sup>5</sup>B. Estudent, Department of Civil Engineering, New Horizon Institute of Technology and Management, Maharashtra, India

\*\*\*\*\*

**Abstract** - Primavera, a renowned project management software, offers comprehensive features tailored to the needs of construction projects, including circular water tank construction. This abstract presents an overview of how Primavera facilitates the planning, scheduling, and monitoring of circular water tank projects. Primavera enables project managers to create detailed work breakdown structures (WBS) for circular water tank projects, breaking down the construction process into manageable tasks. With its robust scheduling capabilities, Primavera assists in establishing realistic timelines, considering factors such as material availability, manpower allocation, and weather conditions. Resources management is critical in circular water tank construction to ensure the availability of skilled labor, equipment, and materials at the right time. Primavera's resource allocation tools help optimize resource utilization and prevent bottlenecks, thereby enhancing project efficiency.

**Key words:** Planning, scheduling, Monitoring, resource allocation, Weather conditions, labour requirement.

\*\*\*\*\*

## 1. INTRODUCTION

Primavera includes improved project scheduling, resource management, and communication among stakeholders. Challenges may include the initial learning curve for users and the need for seamless integration with other construction technologies. Construction projects involve complex workflows with multiple stakeholders, including architects, engineers, contractors, subcontractors, suppliers, and project owners. Integration within Primavera facilitates collaboration and communication among these stakeholders by providing a centralized platform for sharing project information, tracking progress, and managing tasks. Circular water tanks are crucial infrastructure elements in various industries, including agriculture, manufacturing, and municipal services. Smart construction methodologies enhance efficiency, reduce costs, and improve the overall quality of these tanks. Integrating Primavera, a project management software, into the construction process offers numerous benefits. This literature review aims to explore existing research and practices concerning the integration of Primavera for the smart construction of circular water tanks. Smart Construction Techniques: Smart construction techniques involve the integration of advanced technologies such as Building Information Modeling (BIM), Internet of Things (IoT), and automation to streamline construction processes. Research

by Smith et al. (2019) demonstrates how IoT sensors can monitor material quantities, temperature, and structural integrity during tank construction, providing real-time data for decision-making. Role of Primavera in Construction Management: Primavera is a widely used project management software that facilitates scheduling, resource allocation, and budgeting. Studies by Jones et al. (2018) highlight Primavera's effectiveness in optimizing construction schedules and resource utilization, leading to improved project outcomes. Integration of Primavera in Circular Water Tank Construction: Few studies specifically focus on integrating Primavera for circular water tank construction. Case studies by Engineering Solutions Inc. (2020) demonstrate how Primavera was integrated into the construction process of circular water tanks, resulting in reduced construction time and improved project coordination. Benefits and Challenges: Benefits of integrating. Future Directions: Future research should explore advanced integration of Primavera with BIM and IoT for enhanced real-time monitoring and decision support. Additionally, studies could investigate the long-term performance and sustainability implications of smart construction methodologies in circular water tank project

## 2. LITERATURE overview

1. RAJ SARAN et al (2016) [1],
2. AMIRHOSSEIN BALAJI et al., [1].

3. RESHMA MARY JOHNSON et al., [2].
4. T. SUBRAMANI, M MUHAMMED ANSAR, S. PRIYANKA
5. Y. UNMESH
6. U. SUBRAMANI, SARKUNAM, J. JAYALAKSHMI
7. P. ESAKKI THANGAM
8. NISARG M. MISTRY, MAYANK A. KANANI, DR. NEERAJ
9. VEENA .H.C

### 3.METHODOLOGY

#### 3.1.1 Desire assessment:

discover the purpose and necessities of the water tank, which include its intended use, size, and area.  
determine the specific needs of the community or industry the tank will serve.

#### 3.1.2 Regulatory Compliance:

recognize and follow local, nation, and country wide guidelines and requirements for water tank production, such as safety, environmental, and high-quality standards.

#### 3.1.3 Site Choice:

behavior a domain survey and geological assessment to pick out an appropriate area for the water tank. bear in mind factors which include proximity to water assets, elevation, accessibility, and environmental impact.

#### 3.1.4 Design and Engineering:

engage engineers and designers to develop designated layout plans, together with structural specs, materials, and protection measures.  
ensure the design is well matched with the meant use and complies with regulations.

#### 3.1.5 Budgeting and cost Estimation:

Create a detailed finances for the development assignment, accounting for substances, labor, gadget, permits, and any extra prices.  
increase a contingency price range to cope with unforeseen fees.

#### 3.1.6 Useful resource Allocation:

determine the allocation of resources, consisting of labor, substances, and equipment, at some stage in the task.  
set up a resource agenda to make sure timely availability.

#### 3.1.7 Mission time table:

expand a comprehensive challenge agenda that outlines the timeline for every production segment.  
become aware of milestones and critical paths to song

progress efficaciously.

#### 3.1.8 Allowing and Approvals:

collect the vital permits and approvals from relevant government, consisting of environmental corporations, neighborhood municipalities, and water regulatory our bodies.

#### 3.1.9 Contracting and Procurement:

pick contractors, suppliers, and subcontractors through a aggressive bidding manner or negotiations.  
Create clean contracts and procurement agreements.

#### 3.1.10 Pleasant Guarantee And Manipulate:

develop a nice manipulate plan to make sure that the development meets layout and regulatory requirements.  
implement normal inspections and trying out.

#### 3.1.11 Protection Measures:

establish a comprehensive safety plan to shield employees and ensure a safe operating environment.  
offer safety training and compliance with occupational health and safety guidelines.

#### 3.1.12 Communication and Stakeholder Engagement:

They hold clear conversation with all mission stakeholders, inclusive of contractors, undertaking teams, regulators, and the network.  
cope with worries and provide updates frequently.

#### 3.1.13Risk management:

Discover potential risks and expand a chance management plan to mitigate and cope with issues as they arise.  
ensure coverage insurance is in place to manipulate unexpected activities.

#### 3.1.14 Environmental concerns:

put in force environmentally accountable creation practices to reduce the undertaking's impact at the atmosphere.  
address ability environmental issues and follow nice practices for sustainability.

#### 3.1.15 Project Documentation:

hold certain statistics and documentation in the course of the undertaking, together with layout plans, lets in, contracts, and project progress reviews.

#### 3.1.16 Project Kick-Off:

formally launch the challenge with a kick-off meeting concerning all key stakeholders  
evaluation task goals, schedules, responsibilities, and safety measures.

**3.1.17 Tracking and control:**

continuously monitor project progress, useful resource allocation, charges, and excellent. enforce modifications or corrective movements as needed. surrender the water tank to the right authorities or operator fee the water tank to ensure it functions as supposed.

**3.1.18 Completion and Commissioning:**

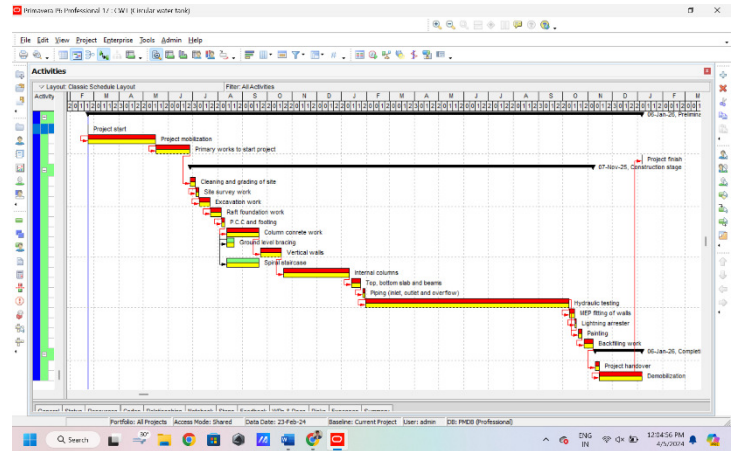
whole creation in keeping with the venture agenda and fine standards.

**4 SPECIFICATONS OF SCHEDULING & COST OPTIMIZATION.**

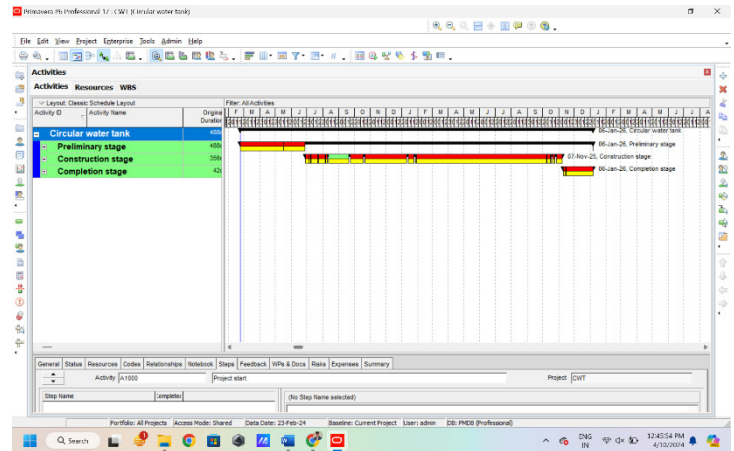
**4.1 ACTIVITY TABLE**

Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Activity Type	Resources	Duration Type
<b>Preliminary stage</b>								
A1000	Project start	0	23-Feb-24	23-Feb-24	Rs0.00	Task Dependent	Chief Engineer, Project Manager	Fixed Duration & Units
A1010	Project mobilization	806	23-Feb-24	16-May-24	Rs400,000.00	Task Dependent	Project Manager, Chief Engineer, Deputy Engineer, Junior E	Fixed Duration & Units
A1020	Primary works to start project	306	27-Jun-24	17-Aug-24	Rs200,000.00	Task Dependent	Site Supervisor, Deputy Engineer, Project Manager, Chief E	Fixed Duration & Units
A1020	Project finish	56	08-Jun-26	08-Jun-26	Rs0.00	Task Dependent	Project Manager, Chief Engineer	Fixed Duration & Units
<b>Construction stage</b>								
A1030	Clearing and grading of site	56	08-Jun-26	04-Jul-26	Rs8,000.00	Task Dependent	Labour, Site Supervisor, Junior Engineer	Fixed Duration & Units
A1040	Site survey work	26	05-Jul-26	05-Jul-26	Rs0.00	Task Dependent	Labour, Site Supervisor, Surveyor, Junior Engineer	Fixed Duration & Units
A1050	Excavation work	106	09-Jul-26	22-Jul-26	Rs450,000.00	Task Dependent	Excavator, Chief Engineer, Site Supervisor, Labour, Mason	Fixed Duration & Units
A1060	Raft foundation work	106	09-Aug-24	25-Aug-24	Rs1,100,000.00	Task Dependent	Mason, Labour, Fuel Mixer, Steel Fabric, Carpenter, Site Su	Fixed Duration & Units
A1070	F.C.C and footing	46	08-Aug-24	08-Aug-24	Rs481,844.00	Task Dependent	Site Supervisor, Deputy Engineer, Junior Engineer, Labour	Fixed Duration & Units
A1080	Column concrete work	306	10-Aug-24	20-Sep-24	Rs4,296,000.00	Task Dependent	Labour, Steel Fixer, Form Helper, Scaffold, Site Super	Fixed Duration & Units
A1090	Ground level bearing	56	10-Aug-24	10-Aug-24	Rs484,000.00	Task Dependent	Labour, Scaffold, Form Helper, Chief Engineer, Site Super	Fixed Duration & Units
A1100	Vertical walls	206	22-Sep-24	15-Oct-24	Rs3,109,170.00	Task Dependent	NSC Trucks, Junior Engineer, Deputy Engineer, Site Super	Fixed Duration & Units
A1110	Spiral staircase	306	10-Aug-24	20-Sep-24	Rs1,595,700.00	Task Dependent	Labour, Steel Fixer, Form Helper, Scaffold, Site Super	Fixed Duration & Units
A1120	Internal columns	606	21-Oct-25	10-Nov-25	Rs4,166,440.00	Task Dependent	Labour, Steel Fixer, Form Helper, Carpenter, Site Supervisor	Fixed Duration & Units
A1130	Top, bottom slab and beams	106	21-Oct-25	26-Jan-25	Rs763,840.00	Task Dependent	Chief Engineer, Site Supervisor, Junior Engineer, Labour, S	Fixed Duration & Units
A1140	Piping (incl. outlet and overflow)	36	27-Jan-25	28-Jan-25	Rs79,844.00	Task Dependent	Labour, Form Helper, Site Supervisor, Plumber	Fixed Duration & Units
A1150	Hydraulic testing	106	30-Jan-25	05-Feb-25	Rs794,000.00	Task Dependent	Junior Engineer, Site Supervisor, Form Helper	Fixed Duration & Units
A1160	MEP fitting of walls	56	05-Feb-25	05-Feb-25	Rs37,000.00	Task Dependent	Plumber, Electrician, Mechanic, Site Supervisor, Chief Eng	Fixed Duration & Units
A1170	Lighting arrester	26	05-Feb-25	17-Feb-25	Rs1,400.00	Task Dependent	Electrician, Site Supervisor, Junior Engineer	Fixed Duration & Units
A1180	Painting	56	05-Feb-25	05-Feb-25	Rs200,000.00	Task Dependent	Scaffold, Site Supervisor, Junior Engineer, Painter, Arch	Fixed Duration & Units
A1190	Backfilling work	106	07-Nov-25	07-Nov-25	Rs310,440.00	Task Dependent	Mason, Labour, Site Supervisor, Junior Engineer, Hyva Tru	Fixed Duration & Units
<b>Completion stage</b>								
A1200	Project handover	426	16-Nov-25	16-Nov-25	Rs696,000.00	Task Dependent	Project Manager, Chief Engineer, Deputy Engineer, Site Su	Fixed Duration & Units
A1210	Project mobilization	56	10-Nov-25	14-Nov-25	Rs44,000.00	Task Dependent	Project Manager, Chief Engineer, Deputy Engineer, Site Su	Fixed Duration & Units
A1210	Demobilization	456	11-Nov-25	08-Jan-26	Rs442,500.00	Task Dependent	Chief Engineer, Project Manager, Deputy Engineer	Fixed Duration & Units

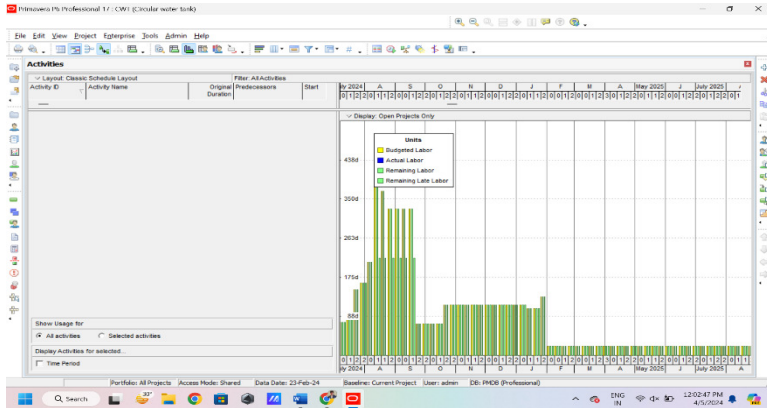
**4.3 SCHEDULE PATH**



**4.4 WBS CHART**



**4.2 LABOUR ALLOCATION**



**5. CONCLUSION**

As per the requirements and referring to efficient allocation of resources, including labor, materials, and equipment, is crucial to prevent delays we have achieved in real-time data access making an effective project oversight. Delays and miscellaneous cost have been taken in to consideration and final report has been made according to the data collected and provided by the site engineer.

**6. ACKNOWLEDGEMENT**

1. We have prevented delays in duration and also have prevented budget overruns an made project viable.
2. We learned about accurate reporting for essential decision making and progress oversight.

## 7. REFERENCE

- 1) Balali, A., Moehler, R.C. and Valipour, A., (2020); "Ranking cost overrun elements in the mega medical institution creation projects the use of Delphi-SWARA approach: an Iranian case study".
- 2) Vignesh. V., "useful resource Optimization of creation initiatives the usage of Primavera P6", IOSR journal of Mechanical and Civil Engineering (IOSR JMCE), Vol. 14, no. 1 Ver.V, pp. 01- 08, January – February, 2017.
- 3) Rhuta Joshi, and Prof. V. Z. Patil (2015), "resource Scheduling of production undertaking: Case study", global journal of technological know-how and research (IJSR), Vol. 4, no. 5, may additionally, 2015.
- 4) Rashmi. J. V., Amey A. Kelkar, and Vishwanath ok. G. (2017), "planning and Scheduling of Multi-Storeyed Residential constructing with conventional Execution approach in comparison with software of venture management strategies", worldwide research magazine of Engineering and technology (IRJET), Vol. 04, no. 07, pp. 2682-2685, July-2017.
- 5) Akshay R. Kohli, 2017, "company venture management the use of primavera p6 EPPM", global studies magazine of engineering and technology (IRJET) extent 04, Issue 2.e-ISSN 2395-0056, P-ISSN, 2395-
- 6) Anurag Mahure, Amitkumar Ranit, 2018, "mission control using primavera p6" global journal of engineering research and technology (IJERT). ISSN :2278-0181,
- 7) Nisarg M. Mistry, Mayank A. Kanani, Dr. Neeraj D. Sharma, Rushabh, "software of primavera software for scheduling of row residence to complete assignment on time" international magazine of advanced studies in engineering technology and management ISSN :2394-1766