

# Enhancing Construction Project Management with Primavera P6: A Case Study of the Pradhan Mantri Awas Yojana

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**Abstract:** *Large construction projects, with their extensive resource requirements and time-sensitive, cost-associated tasks, demand effective project management tools. This research delves into the challenges faced by project teams in handling tasks for large-budget construction projects and explores the potential of Oracle's Primavera Project Planner P6 as a valuable asset. Despite its proven success globally, there is hesitancy among Indian contractors in adopting this tool. The study investigates the utilization of Primavera P6 for planning and scheduling, emphasizing the need for detailed and purposeful schedules. Focused on a case study under the government program "Awas Yojana," the research aims to enhance project outcomes through efficient scheduling, financial risk analysis, and resource management.*

**Keywords:** *Primavera P6, Project Management, Project Planning, Scheduling, Construction Projects, Financial Risk Analysis, Awas Yojana, Resource Management.*

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## I. INTRODUCTION

Project consumes several resources in its lifetime to achieve the desired goal. The resources have time dependent, direct or indirect costs related to them. For large Construction projects with huge budget; it becomes very difficult for the project team to handle the tasks

So, it becomes very necessary to provide a tool in the hand of project team that helps keep a track of activities in the project. Primavera Project Planner P6, a software from Oracle is an incredible asset present in the possession of the venture group.

The product helps in arranging, planning and controlling of activities effectively. Contractual workers in India are hesitant to utilize venture arranging and planning procedures, which are being utilized the world over and right now demonstrated as a benchmark for in time fruition of tasks. The investigation incorporates conversation/presentation on Primavera P6 a venture arranging and planning device accessible [1].

The nature of timetable created from the product regularly needs detail and the reason for the product in enhancing the venture is for the most part not met by the clients in India.

Notwithstanding giving information on different undertaking errands, their interrelationship, conditions to anticipate all out venture length during the arranging stage. The timetable should be complete enough to let the client comprehend in detail the motivation behind different exercises in the timetable.

In this day and age development industry is one of the most broadly utilized and quickly roaring ventures of our country and over the world.

### A. Project Management

Project Planning is a general and most common term in the construction management which refers to attain the expected goals and destinations. Planning is the key to bring the expected projects into reality or existence [2]. Therefore, the term project management has been in use in various platforms to be close to the aims designed in construction projects. In general, planning involves the breakdown of the undertaken project with small definable, identifiable and quantifiable tasks or activities and this constitutes the logical interdependencies between them. Basically, the project planning process refers to three dominant questions, stated as

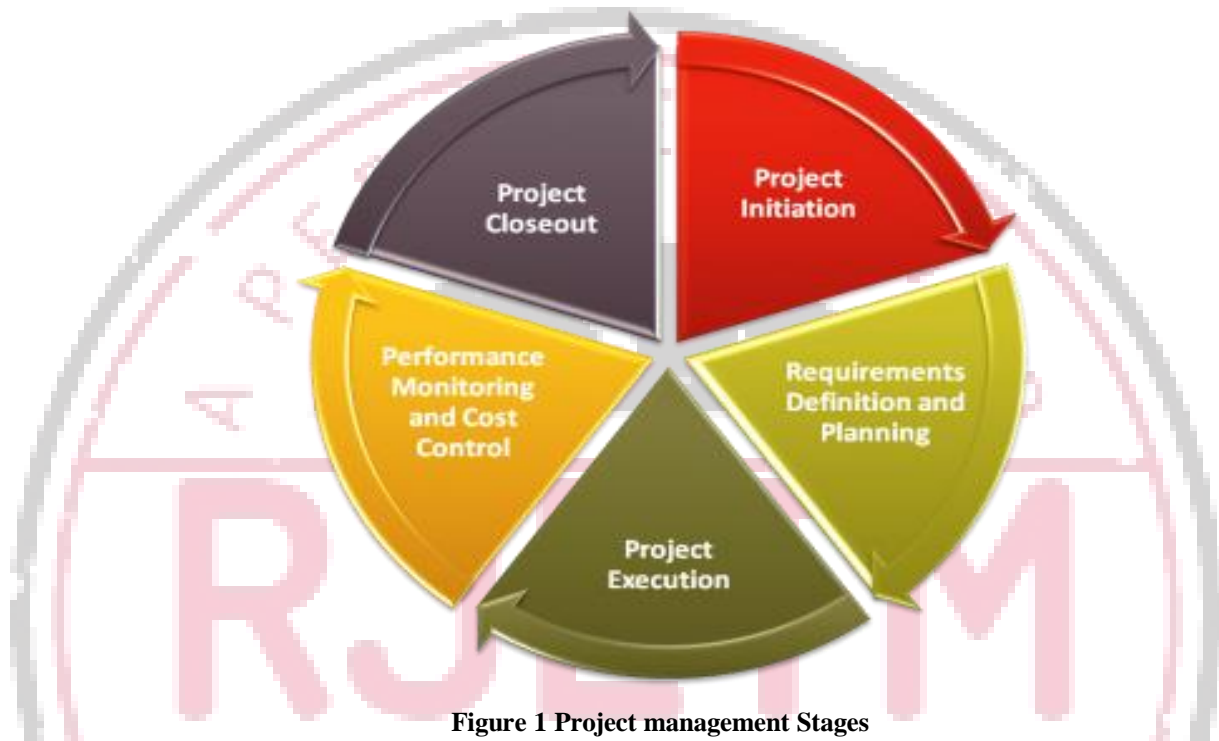
- What is to be done?
- Who does it?
- How to do it?

Scheduling refers to slotting out time duration using explicit analysis during the planning of each and every activity to know the final project duration and the project delivery time. In other words it governs the timing for each work activities recognized by the process of planning before or during the execution of the project. Typically it defined and signifies the sequential order activities in phasing various individual project in a symmetrical manner in order to accomplish the project.

The schedule is a tool for every project management team which is used and practiced to predict the most probable project completion tenure and thus enabling the in/on time resource completion which are budgeted in the particular work [3].

The general steps involved in the development of a proper schedule as stated below:

- Proper time estimation of every activities.
- Project planner should know the obligations of the time for the project completion and delivery.
- The activities such as must start and must finish should be establish well recessed.
- Sorting out of the activities which are crucial to timely completion of the project should be recognized and kept in mind.



### B. Financial Risk Analysis

Financial uncertainties lead to unplanned structure loss in any huge project. Such losses can be ensured due to exceeding the dead line of the projects, or sometimes due to absolute management and may be a natural disaster such as landslide or earthquake of flood or any man made hazards namely theft, robbery or earthquake due to mining [4].

The project is considering financial management, inventory management and human resource management using the application “Primavera P6 V 8.3”.

### C. Objectives and Scope of Work

#### Objectives

- To develop scheduling and planning using Primavera P6 V8.3 for Structure prepared under government program “AwasYojana”.
- To prepare construction sequence and comparative analysis in between two structure blocks and identification of reasons in delay.
- Conducting Financial Risk analysis using gantt chart in Primavera P6.
- To assign proper sequence and links between different activities for early finish.

#### Scope of Work

The primavera P6 application was being the first source in conducting the research. Basically the research was an explanatory study on implementation of Primavera in every aspect of the project which comprise of Planning and Scheduling stage followed by the monitoring and controlling Stage.

### D. Organization of the Thesis

The thesis has been divided into seven chapters

- Chapter one contains introduction of Project Management, History Perspective, classification of construction projects and problem statement.
- Second Chapter contains literature review for construction project planning, scheduling and project management.
- Third Chapter includes project overview, project information, method of scheduling and activities involved in project.
- Fourth Chapter involves construction planning, types of project plan, sequence of work using software and flow chart of the study work.
- Fifth Chapter includes report generation and result discussion.

Sixth Chapter dealt with conclusion of the study and future scope for further research.

## II. LITERATURE REVIEW

**Alberto Cerezo-Narváez et. al. (2020)[6]** the research paper dissected whether the coordination of a cost breakdown structure (CBS) can prompt the age of more vigorous WBSs in development ventures. Throughout the most recent years, some global associations have normalized and fit diverse cost arrangement frameworks (e.g., ISO 12006-2, ISO 81346-12, OmniClass, CoClass, UniClass). These cost data sets have likewise been brought into building data displaying (BIM) structures. We estimate that in BIM conditions if these CBSs are utilized to produce the venture WBS, a few preferences are increased, for example, more keen task definition. This upgraded venture definition decreases venture logical inconsistencies at both arranging and execution stages, foresees likely timetable and spending deviations, improves asset designation, and by and large it permits a superior reaction to potential task chances. The speculation that the utilization of CBS's can produce more vigorous WBSs is tried by the reaction investigation of a poll overview disseminated among development professionals and venture administrators. Utilizing auxiliary condition demonstrating (SEM), the connection (understanding) and recognition contrasts between two 250-respondent subsamples (specialized venture staff versus venture the executive's staff).

**Abdul Aziz and Sanjeet Kumar (2019)[7]** 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, Hyderabad formed 560 days by the contractor, which was approximately equal to 18 months, 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.

**Kottamasu L. N. Panakala Rao and K. Shyam Chamberlin (2019)[8]** 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.

**Samad M. E. Sepasgozar et.al (2019)[9]** 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 variables are broken information investigation and interpretation because of little examples of members or low information dependability, the unequalled structure of examination polls with the current approaches or guidelines, neglecting the impacts of innovation appropriation by development partners, and overlooking Jobsite updated gear. The key insufficiencies were distinguished as broken of information examination and understandings because of little example of members or low information dependability, the unrivalled structure of exploration surveys with the current arrangements or principles, disregarding the impacts of innovation reception by development partners, and overlooking Jobsite overhauled gear.

**AnuragMahure and AmitkumarRanit (2018)[10]** the primary objective of the examination was to plan, timetable, and track a private venture with assistance of primavera programming, study the outcomes created, it was conceivable to recommend which strategy is appropriate for the chosen private task. Venture Monitoring goes about as a notice system;

it is the way toward recording, gathering and revealing data concerning extending execution that the undertaking supervisor and others wish to know. Observing incorporates watching the advancement of the undertaking against time, execution timetable and assets during a real execution of the venture and it distinguished the slacking regions which require opportune consideration and activities. It is extremely normal to see venture neglecting to accomplish their missions inside determined time and financial plan, the components causing invade as expressed above insufficient undertaking definition, lack of foresight and absence of task the board during execution, however, the fundamental driver of disappointment can be ascribed to cost assessment disappointment and the executives disappointment.

**Ajesh Pilaniya and Ashwin A. Mahajan (2018)[11]** 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.

**Mohammad Afzal S. Siddiqui and Abhijit N. Bhirud (2018)[12]** 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 Pimprichinchwad 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.

**Akshay R. Kohli (2017)[13]** 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.

### III. METHODOLOGY FOR PROJECT PLANNING AND SCHEDULING

The engineering and construction ventures have a wide scope of temporary workers, providers and producers who range from a large number of representatives worldwide to gatherings of a few people. The independent form of P6 is broadly utilized over this gathering. The utilization goes from the full boost of the product's highlights to simply utilizing the framework as a celebrated schedule. The authoritative revealing necessities among bigger and more modest associations regularly specify that Primavera P6 be utilized for venture refreshes. The independent form of the product is frequently used to help these necessities on a venture by venture premise.

Primavera P6 is facilitated by a SQL worker. This implies that numerous members can get to the information base simultaneously and perform particular undertakings. Undertakings can be partitioned and stacked into chains of importance that coordinate the association's structure. Dynamic planning technique depends on circuitous exercises which are executed by different Project Management Team and its partners.

- Work/ Budget Scope- Project Management Team/ office.
- Strategic Planning- Project Management Team/ office.
- Project Work breakdown Structure – Scheduler of the project.
- Focused on the geographical and the physical breakdown of the past.

#### A. Project case Study

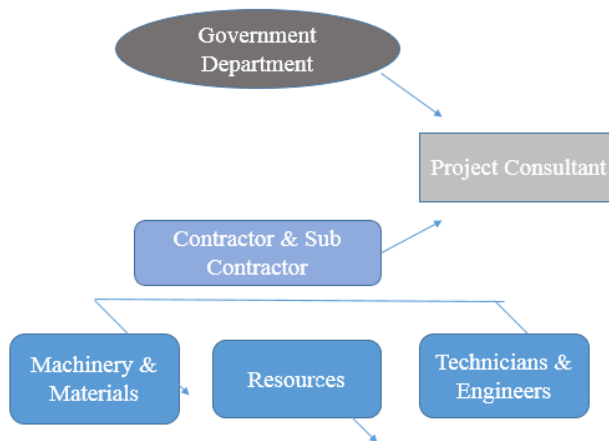
Pradhan Mantri Awas Yojana (Urban) Mission dispatched on 25th June 2015 which expects to give lodging to all in metropolitan territories continuously 2022. The Mission gives Central Assistance to the executing offices through States/Union Territories (UTs) and Central Nodal Agencies (CNAs) for giving houses to every qualified family/recipients against the approved interest for houses for about 1.12 cr. According to PMAY (U) rules, the size of a house for Economically Weaker Section (EWS) could be up to 30 sq. mt. cover zone, notwithstanding, States/UTs have the adaptability to improve the size of houses in interview and endorsement of the Ministry.

The following sub work breakdown Structure (W.B.S) are:



WBS is a grouping of different elements of the project with concerned to specific project and it organizes or impinges to determine the overall intent of the project.

- Survey and Site Investigation.
- Substructure.
- Super Structure.
- Finishing Work



**Figure 2 Hierarchal Structure of Construction Project Team**

### Project Details



**Figure 3 Site Picture of Block A**



Figure 4 Site Picture of Block B

Table 3.1 Project Details

Name of Work	Pradhan Mantri Awas Yojana Bhopal, New Market
Name of Agency	Nirvana Consultants & Engineers
Amount of Contract	441 Cr.
Date of Start	2017
Tentative Date of Competition	2023

**B. Methods of Project Planning**

**Gantt chart:** -The strategy was developed by Henry Gantt and Fredric Tailor and can be recognized as the logical technique for venture arranging. The strategy utilizes flat bars speaking to the time length of an errand achievement for arranging and assignments' names are composed vertically in isolated sections. Each pole is put before each undertaking and the graph shows the beginning date, achievement time length and completing date of errands.

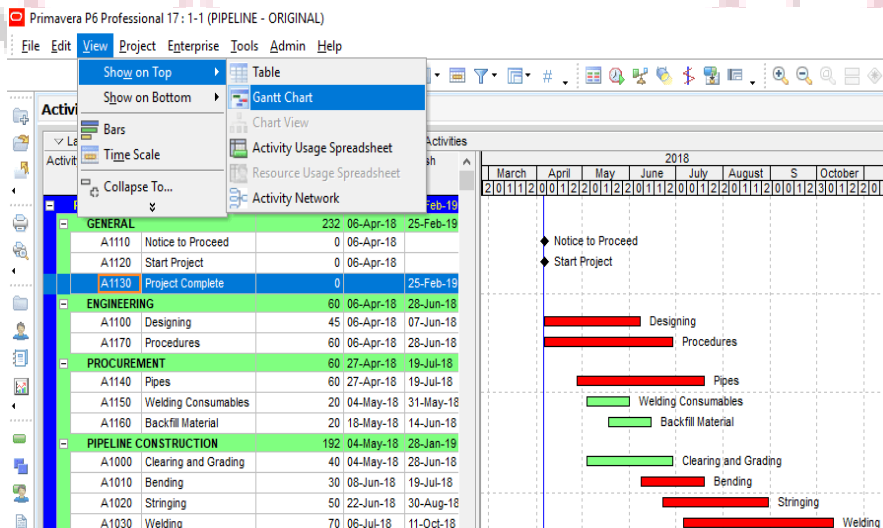


Figure 5 Gantt Chart

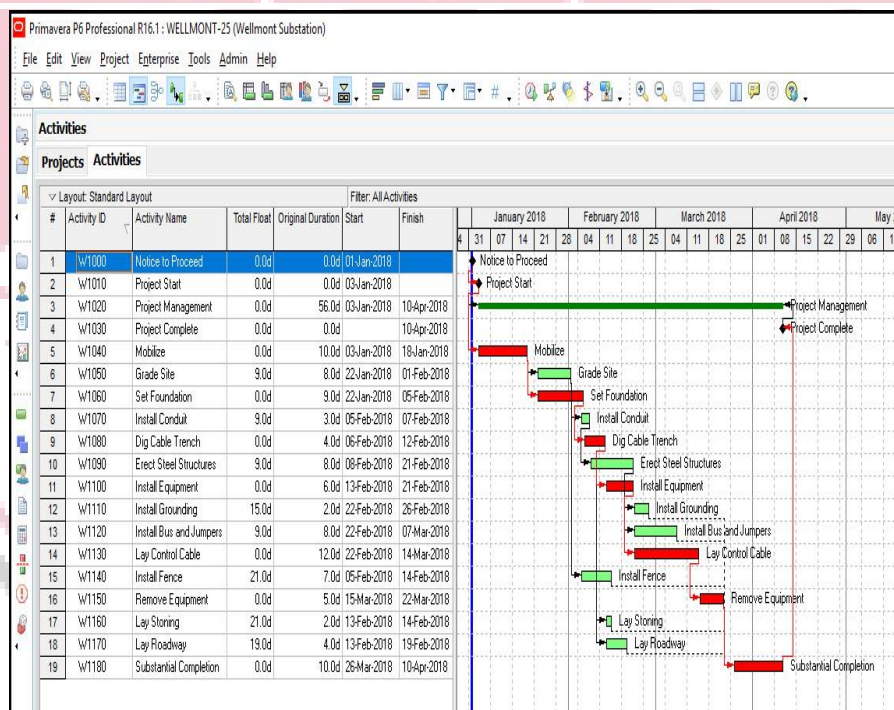
**Network scheduling method:** - One of the significant organization planning strategies which have been utilized in the development business is CPM (basic way technique). This technique includes the utilization of a mathematical portrayal of the stream outline which portrays the priority between exercises. The basic way strategy (CPM) is a term driven procedure in which the fundamental data sources are venture exercises, their lengths, and reliance connections. Movement terms are elements of the assets required (as opposed to accessible) to finish every action. The CPM plan accepts that assets are not confined in any sense. The utilization of organization methods and CPM by development organizations has arrived at a consistent level after the energetic blast of the mid-1960s. Software engineers take out the need to set up an organization, however, the organization documentation gives an effortlessly perceived yield design for the boarding faculty.

Points of interest of Network Scheduling Method:- When contrasting bar graphs and organizations, three preferences over bar diagrams.

- Network show logic, the relationships among the activities. Bar charts do not
- Networks can better represent large and complicated projects.
- Networks can estimate, or predict, the completion date of the project, or other dates, on the basis of mathematical calculations of the CPM

**Scheduling:-**In venture the board, a timetable is a posting of task achievements, exercises and expectations, for the most part with planned beginning and finish dates. A timetable is usually utilized in the undertaking arranging and venture portfolio the board portions of the task the executives. Components of timetable intently identify with work breakdown structure (WBS), exercises, schedule, and length.

**Resources:-**Required assets are those gear and gadgets required for achieving a specific errand. No assignment or action is performed without HR, hardware, equipment's, materials and utilizing different assets. Undertakings required assets of a venture are characterized into three gatherings. One of the groupings by which assets are separated into these classes: inexhaustible assets, non-sustainable assets and assets with double imperatives. Alongside, semi sustainable assets were likewise proposed.



**A. Resource Assignment and Usage**

The resource assignment window shows all the resource assignments, grouped by resource for the project. An approximate rate analysis was done to arrive at rates of individual resource groups, considering the various component resources. Most of the resources are taken as material. Machines are taken as non-labor and human involvement is listed as labor. The resource usage profile obtained using Primavera P6 shows that there has been a slight variation in the quantity of each resource used during the project life cycle.

Display: Current Project's Resources					
Resource ID	Resource Name	Resource Type	Unit of Measure	Primary Role	Default Units / Time
MRG	Rigger	Labor			8/d
CV	Civil Work	Labor		Civil Work	8/d
MF	Mechanical Filter	Labor		Mechanical Filter	8/d
WHW	Workshop Mechanical Labour	Labor		Fabrication of Piping & Suppor	8/d
DEES	DIRECT MECHANICAL LABOUR	Labor			8/d
WS	WORKSHOP LABOUR	Labor			8/d
PFB	Pipe Fitter	Labor			8/d
WND	Workshop NDT Inspections	Labor		Fabrication of Piping & Suppor	8/d
25TR	25 Tonne Rough Terrain	Nonlabor		Cranes	8/d
RG	Rigger	Labor		Rigger	8/d
Paint	Painting Crew	Nonlabor			8/d
WE	Coded Welder	Labor		Welder	8/d
PF	Pipe Fitter / Boilemaker	Labor		Boilemaker / Pipe Fitter	8/d
TA	Labourer - Trade Assistant	Labor		Labourer	8/d
HW	Labourer - Hot Work Senty	Labor		Labourer	8/d
STL	Steel erection labour	Labor		Labourer	8/d
LS	Laggers/Sheetmetal Workers	Labor			8/d
SC	Scaffolding	Labor		Scaffold Erection & Dismante	8/d
ND	Non Destructive Testing	Labor		Non Destructive Testing	8/d
PT	Painting & Gritblasting	Labor		Painting & Gritblasting	8/d
RF	Refractory	Labor			8/d
FP	Fireproofing	Labor		Fireproofing	8/d
LSC	Scaffolders	Labor			8/d

General		Codes	Details	Units & Prices	Roles	Notes	Timesheets
Resource ID	Resource Name						
STL	Steel erection labour						
Employee ID	Title						

Figure 6 Details of Resource

#### IV. ANALYSIS AND REPORT GENERATION

##### A. Case Study

The Pradhan Mantri Awas Yojana (Urban) situated in Bhopal Madhya Pradesh is considered in this research. In this project, preparation of scheduling and planning of the two different blocks in the defined project destination are considered in Bhopal and comparing it with present scheduling which is working on the site.

##### Project Data Analysis

This undertaking was planned on 2016. Work week from Monday shall be utilized and units shall be arranged in days. The activities, ID and duration was entered. The aggregate number of exercises of the task is 41.

##### Project Planning and Scheduling

As soon as we create organization, the activity subtle elements are acquired in the bar graph. The equivalent is further visible in PERT view. The perspective demonstrates the action subtle elements which incorporates activity name, term, managing start and completion date and detailing information segment territory. After recording the initial activities with their start and end dates, one can monitor them throughout the project in the data portion of primavera screen.

Step 1: Selection of Ongoing task, for the undertaken project, considering running venture named “Pradhan MantriAwasYojana”. Monitoring of the project is running by Nirvana Consultants & Engineers.

Step 2: Obtain point by point illustrations and rates which is fundamental for further analysis.

Step 3: With the assistance of task supervisor and site build set up the venture planning utilizing administration device Primavera P6 V 8.3.

Step 4: Detailed examination is done on asset task and levelling utilizing Primavera P6.

Step 5: Assigning Supervisor to every activity, to provide and update the running status of the work on day to day basis according to business sector rates.

Step 6: Preparing Gantt chart graph and system models.

Step 7: Prepare planning according to current side conditions.

Step 8: Comparing both planning and scheduling to counteract flaws.

##### B. Project Scheduling

For task Planning, separated the undertaking in various Work Breakdown Structure (WBS) to appoint labor and length of every activity. The work breakdown structure is depicted beneath:

Survey and Preconstruction work which contains every one of the activity and questions be assembled or taken to the site territory. Like temporary structures namely site office, Testing laboratory, Store room, Inventory Room and others are to



be provided to begin working at the site. Such exercises are important to begin another task to oversee the working on site easily.

Step 1- To create enterprise project of a company to execute company profile.

In this step, creation of the company profile with division in which company operates was prepared. These divisions were further subdivided into streams such as Structure Urban and Structure Rural.

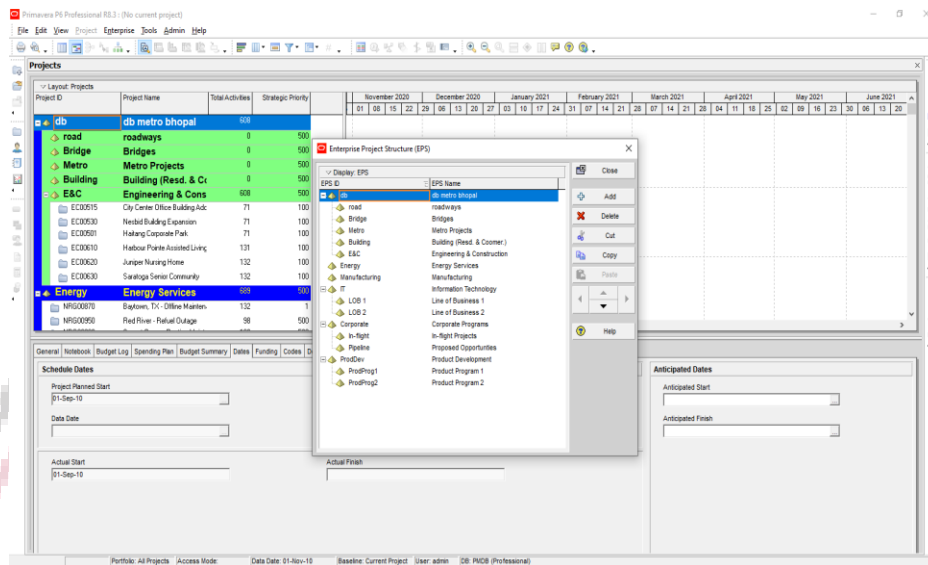


Figure 7 Project Structure

Step 2- Assigning roles and organization structure constituting of company management and responsible managers profile.

The job roles are assigned one the expertise of the employee and the task are assigned as per their qualifications and their experience in the similar tasks as efficient resources are responsible for completion of any project in right intervals and are important for development ventures.

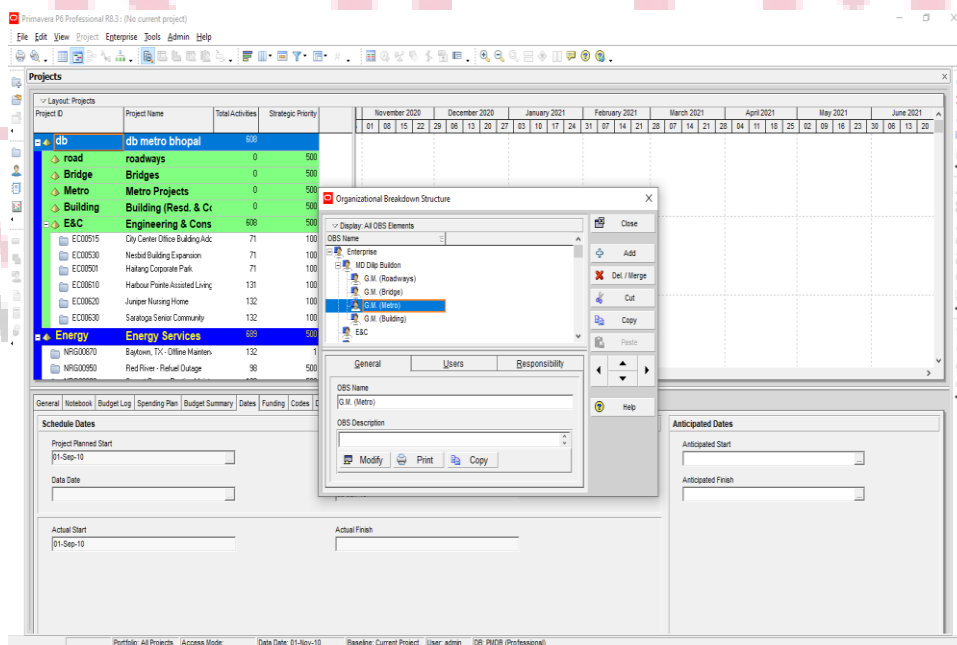


Figure 9 Assigning Job Roles

Step 3- Creating working calendar as per working hours and shifts to be assigned in project:

Before the start of project, the activity list is entered and the calendar are characterized and utilized to display the working time for every action in the task. Calendars are additionally used to characterize the working and occurrence design over the length of the task. These are three unique kinds of schedules namely Global, Venture and customized. The working shift is considered as 8 hours and six days working. The point to point working hours are from 08:00 AM to 05:00 PM. Meal break is of an hour from 12:00 PM to 01:00 PM.

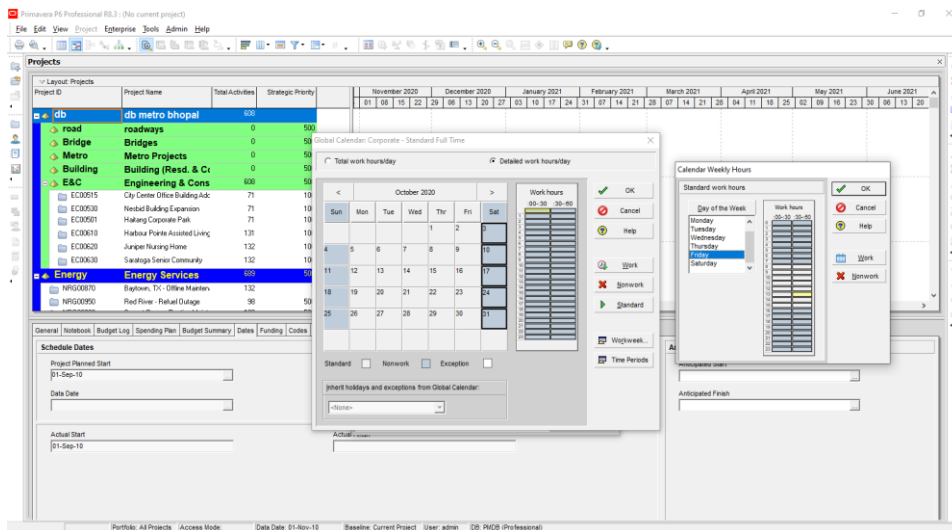


Figure 10 Global Calendar

Step 4- Preparing Work Breakdown Structure

A WBS is the progression of work used to achieve the project to finish a task. WBS is organized in levels work point by point starting with final task and latter formation of different forms into identifiable work components. WBS is based on the individual sub venture and the undertaken WBS is figured beneath:

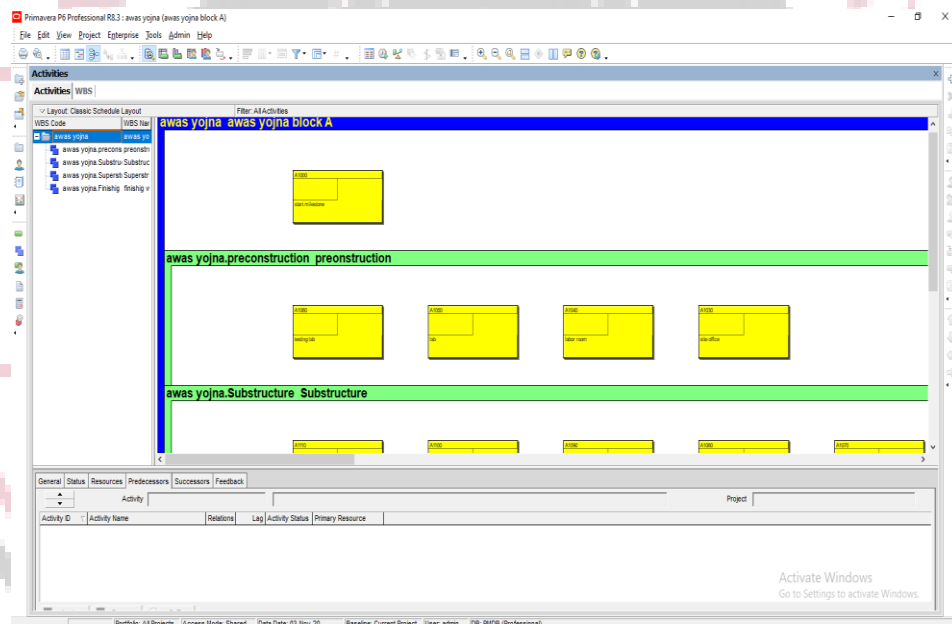


Figure 11 WBS Structure

Step 5- Assigning activities of each WBS as per scheduling data with links in between activities using Gantt chart.

Critical advance in the undertaking arranging is to distinguish the activities to finish the task and furthermore anticipate or valuate the number of days required in completion of the project. The term of exercises is evaluated based on meetings, research, estimation and strategies of costing. These lengths are relegated in every activity. As the undertaking is of tedious kind, in order to identify the approach connected by utilizing CPM as PP apparatus.

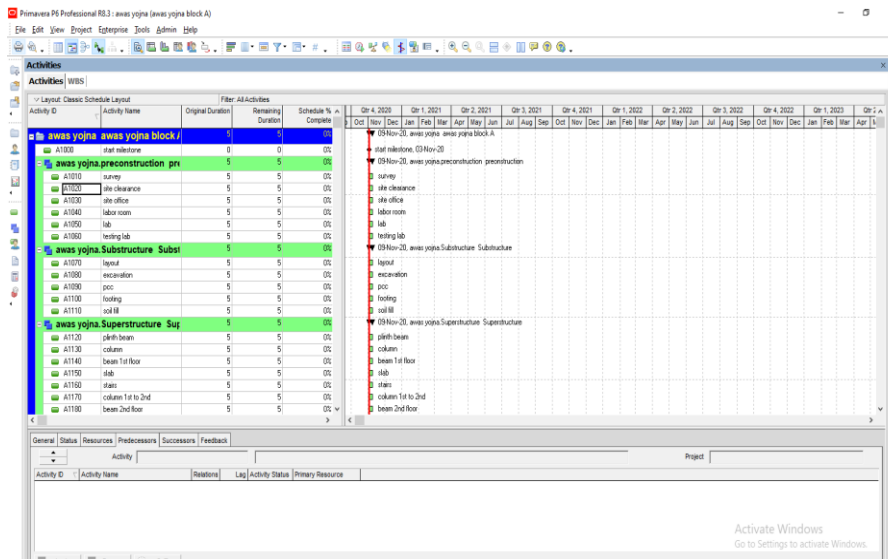


Figure 12 (a)

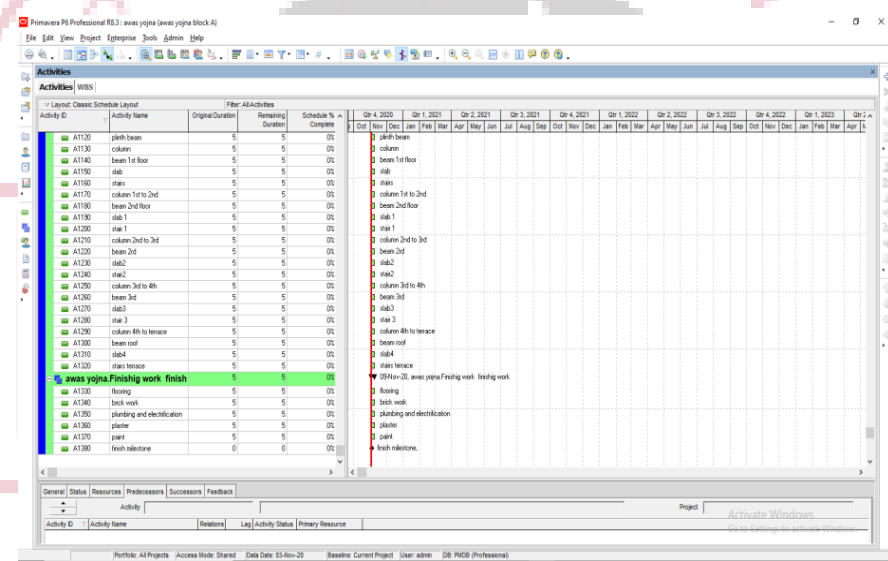


Figure 12 (b)

Figure 12 (a), (b) Activity Details for Block A

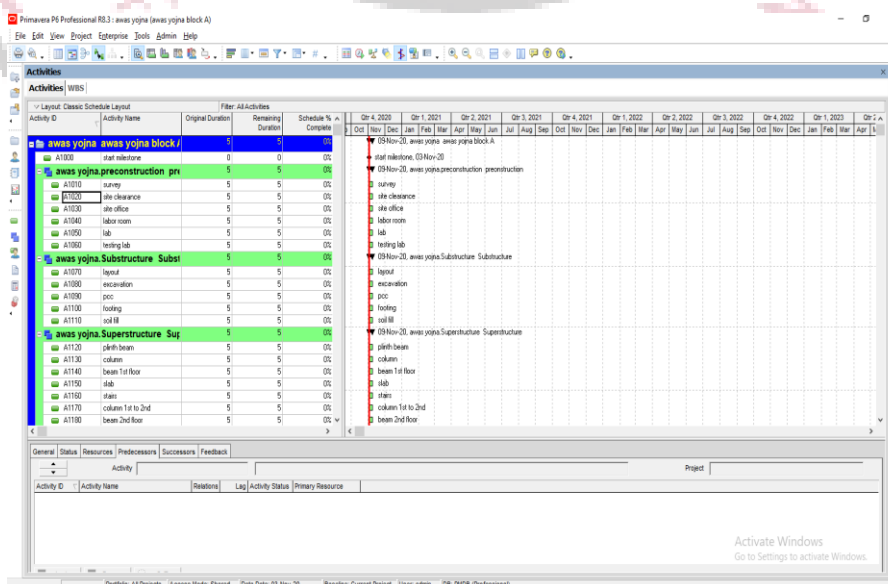


Figure 13 (a)

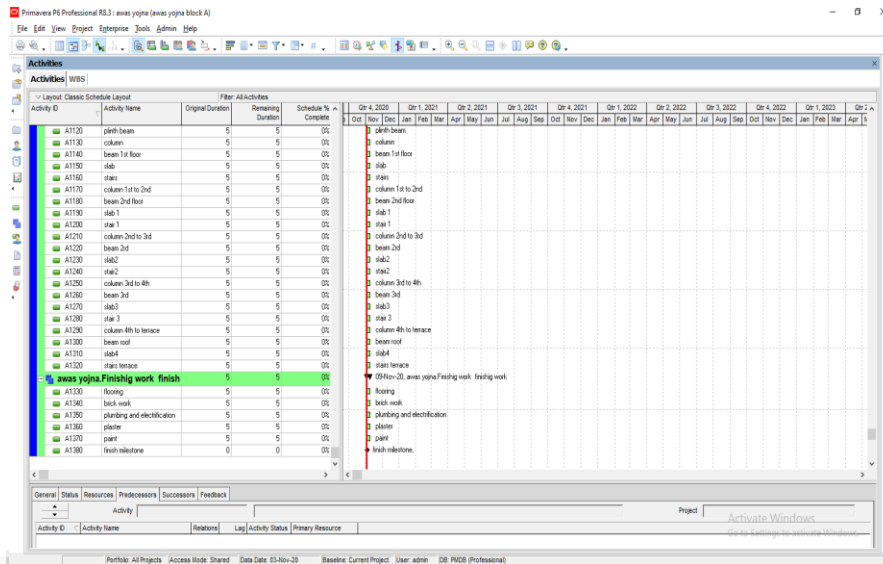


Figure 13 (b)

Figure 13 (a), (b) Activity Details for Block B

### Step 6- Creating Resources (Manpower, Machinery and Material)

The assets are prepared using big business asset, where an option is received get the choice of including new assets. Cost of assets relies on its unit as cost of work is on daily wages, material relies on their weight and machinery relies on its working hours along with its maintainance.

Resource ID	Resource Name	Resource Type	Unit of Measure	Primary Role	Default Units / Time
R-1	concrete	Material	cubic meter		8/d
R-2	job	Nonlabor			8/d
R-3	steel	Material	Tons		8/d
R-8	field engg	Labor			8/d
FieldEng	Field Engineer	Labor		Engineer	8/d
R	AAC BLOCK	Material	Each		8/d
R-6	labour	Labor			8/d

## C. Project Tracking, Monitoring and Controlling

### Creating Target Projects

Our baseline is an entire duplicate venture plan that can be utilised to contrast with the present calendar to access advance. And before refreshing the calendar out of the blue dependable benchmark, the baseline is place as a benchmark for considering the deadlines, assets and expenses to those for the present calendar.

### Updating the Current Projects

Prerecorded in advancement of information is recorded whenever project management to record advances on the present information date. It reconsiders a timetable dependant on the appropriate Date difference and different changes are simply recorded. There are a very few different ways to replace the timetable which includes exercises and assets which can be refreshed separately and can likewise be utilised. This will enable to conjecture the impact of unexpected

### Tracking of the Project

Undertaking administration following the manner in which effective task general managers managing director and other ventures are considered. This is likewise where they provide details regarding how the real outcomes contrast with the first



arrangement. Task administration following a certificate not in mechanical information dump where one can simply recount information.

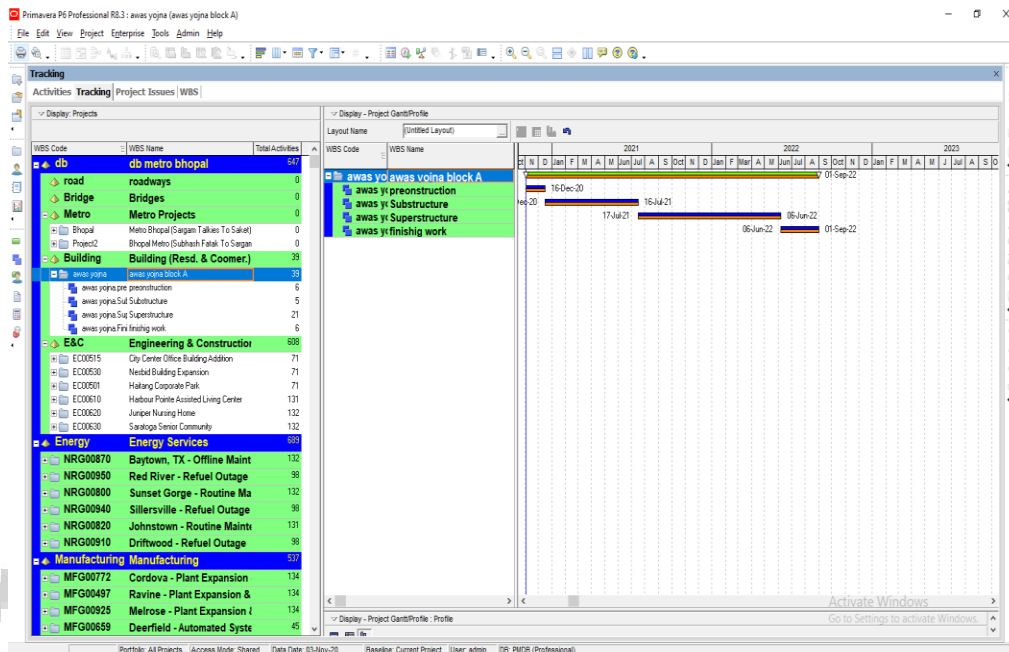


Figure 14 Tracking of Project

#### D. Types of Plans

##### Time Plan

The time is quintessence of all the development task, and contracts frequently have provisions delineating honors for completion of any task as per the time table date. In the event that development of a venture is to continue effectively on the pre-defined rates, it is important to know precisely in advance the sorts and amount of different assets that will be required and on the correct dates on which they shall be required.

##### Manpower Plan

Manpower arranging is a significant part of any association, yet it is especially troublesome in an action which is liable to the same number of factors as thruway development. A cycle utilized in one District of the Washington State Department of Transportation is illustrated. It incorporates a few choices utilized by the District to level occasional varieties in labour.

##### Material Plan

Effectively planning for materials that will be used on a construction site can tend to pose challenges at times. Compressed or changing schedules, lead time variation and availability of materials, poor communication, and even the weather can create disorder getting needed materials to a job site when required. However, when a well thought out plan is put into place before the job starts, dealing with these challenges becomes much easier to coordinate.

##### Construction Equipment Planning

Equipment plays an important role in today’s infrastructure projects as they are more demanding and highway projects are need to be completed in stipulated time with best quality. Proper selection and planning of equipment is very important for timely completion of project, within plant cost and for increasing profit, margin. Selection and planning needs to exercise very seriously as it is one of the factors that affect the progress of work.

##### Finance Plan

Financial Planning is the way toward assessing the capital required and deciding its opposition. It is the way toward outlining budgetary arrangements about acquisition, speculation and organization of assets of a venture. Money related arranging intends to set up a monetary arrangement. A money related arrangement is likewise called a capital arrangement.



Figure 15 Financial Planning

**E. Project Maturity Level**

The areas of project management confirm that the assurance of high level of project management maturity conditions the achievement of project's success. The higher level of maturity means the greater degree of capability to manage a construction project. Contingent on development level, the activities can be comprehensively arranged into the accompanying four classification:

- Highly developed activities these have obviously characterized prerequisites and the settled achievements strategies and procedures, which can be characterized subjectively and quantitatively as far as outline, particular, BOQ and arranged advancement.
- Moderately developed tasks have obviously characterized prerequisites however conveyance process isn't clear.
- Low development ventures have clear necessities yet conveyance process is obscure.
- Poor development ventures these have badly characterized items and hazy conveyance process.

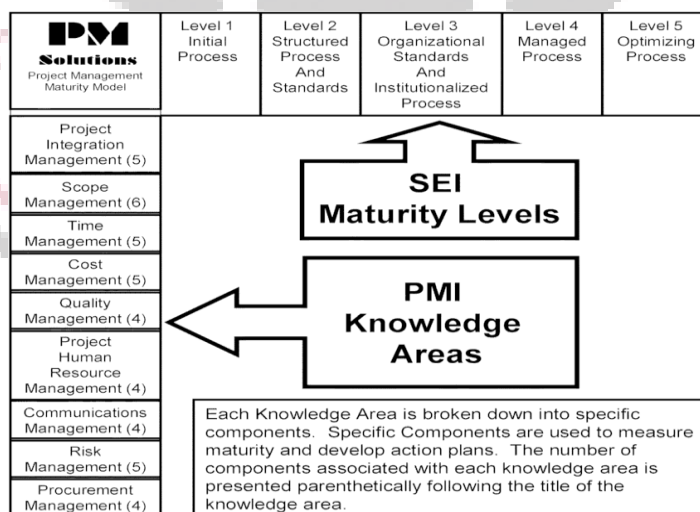


Figure 16 Project maturity Level

**Construction Project Development Phases**

The project management planning investment starts with plausibility examination and it is trailed by choice of proceedings. It is accomplished with prudential units prepared to play from its composed capacity. The period begins and fulfillment of the office is called Construction Project Development Cycle.

A conventional development venture advancement cycle can be partitioned into the most part consecutive stages controlled on baselines of the task. These stages are planning examination, arrangement and obtainment, usage and execution, and further authorizing the task. Four consecutive stages are proposed from the planning examination to its fulfillment stage as presented in the figure below:

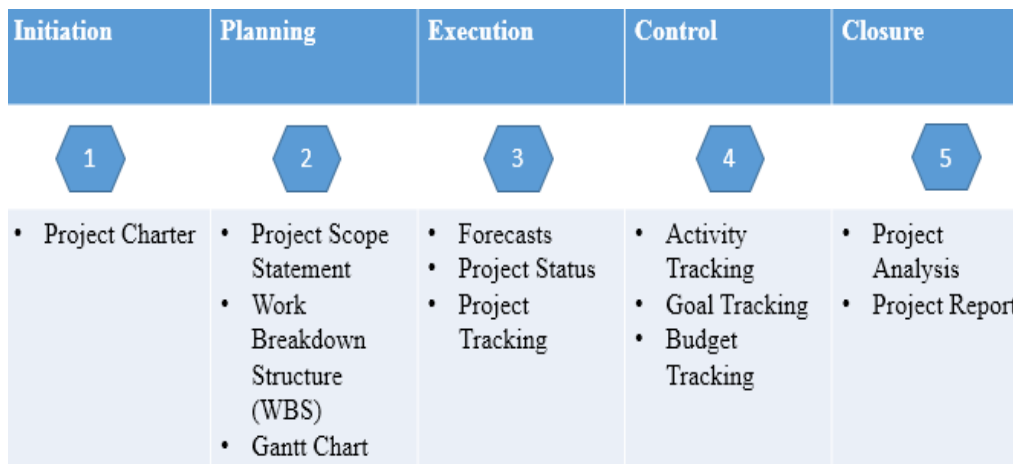


Figure 17 Sequence of Development Phase

**F. Constructional Resources**

The various resources being used in the construction project can be enumerated as:

**Men**

Labor as specialized and administrative faculty and work constrain in different exchanges is basic to do extend exercises. Specialized and administrative work force are basic for effective utilization of Human resources and to accomplish venture fruition inside assessed time and executing plan. Specialized work force incorporate designers, planners, project surveyors, directions, professionals and many more. The work forces comprise of competent members. Report of working gathering on development for India’s Eleventh Plan:- is stated in table below

Table 4.2 Manpower accessed in Construction Sector

S.no	Category	1995	%	2005	%	Growth % in 10 years
		No.	Total	No.	Total	
1	Engineers	687,000	4.7	822,000	2.65	20
2	Technician & Foreman	359,000	2.46	573,000	1.85	60
3	Secretarial	646,000	4.42	738,000	2.38	14
4	Skilled Workers	2,241,000	15.34	3,267,000	10.54	46
5	Unskilled Workers	10,670,000	73.08	25,600,000	82.58	140
	Total	14,603,000	100	31,000	100	100

Table 4.3 Indirect Cost

S.no	Category	Pay Scale per Month (Rupees)
1	Project G.M	2,35,000
2	D.G.M	1.85,000
3	Senior Project Engineer	65,000
4	Quality Engineer	50,000
5	Billing Engineer	50,000
6	Trainee Enginner	12,000
7	Computer Operator	10,000
8	Peon	7,000

Reference values of Pay Scale considered using IDC pay scale.

V. RESULT AND DISCUSSION

A. Project Duration till Date

Table 5.1 Comparison of Project Duration in Block A and Block B.

Project Duration in Days	
Block A	Block B
710	880

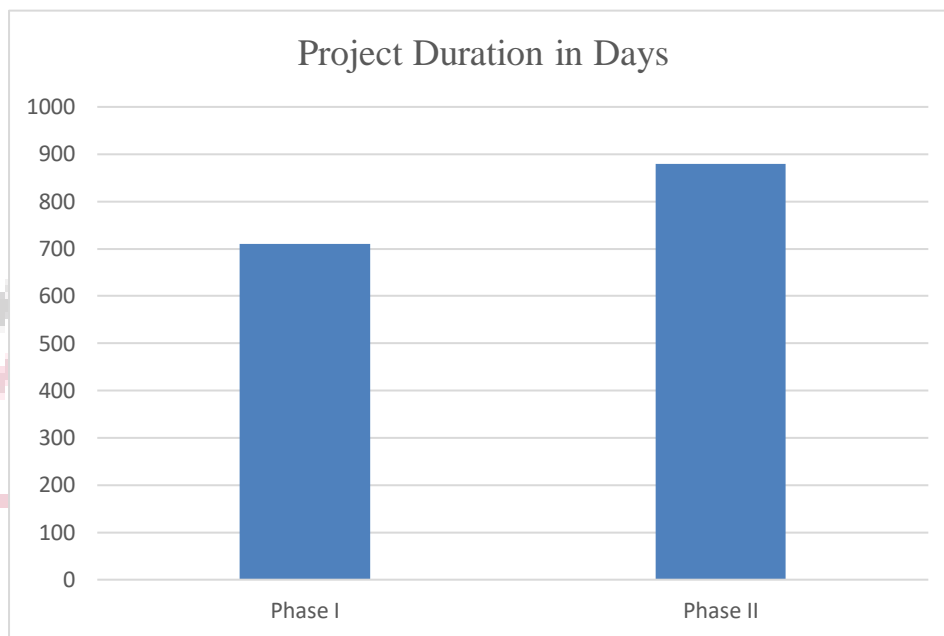
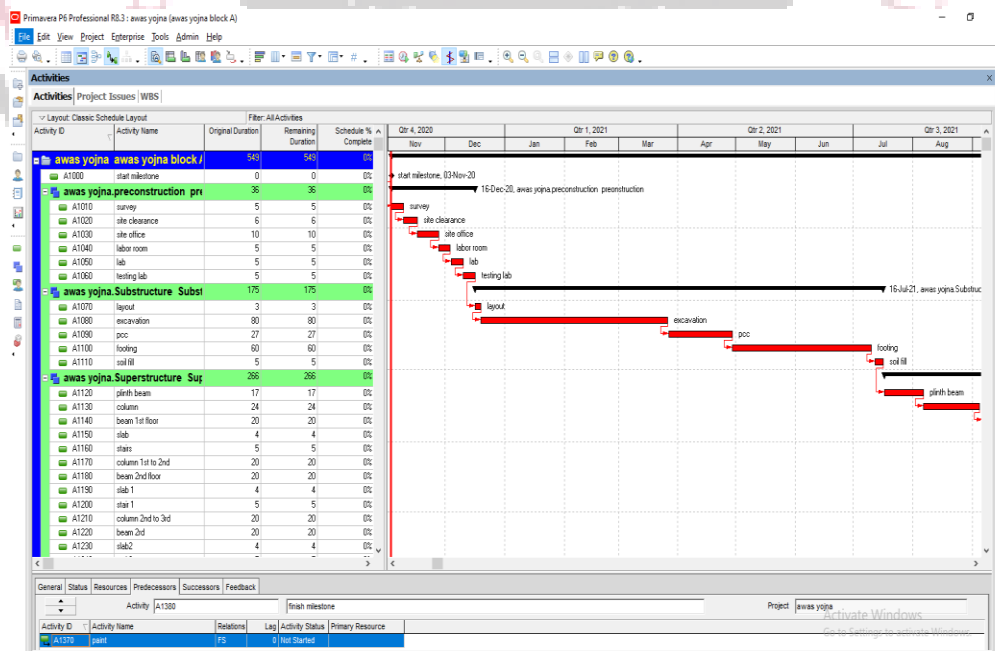


Figure 18 Comparison of Project Duration in Block A and Block B

Discussion: As observed from the project duration Block B is running slow due to lack of availability of resources.

B. Gantt Chart using Primavera P6

PMAY Block A





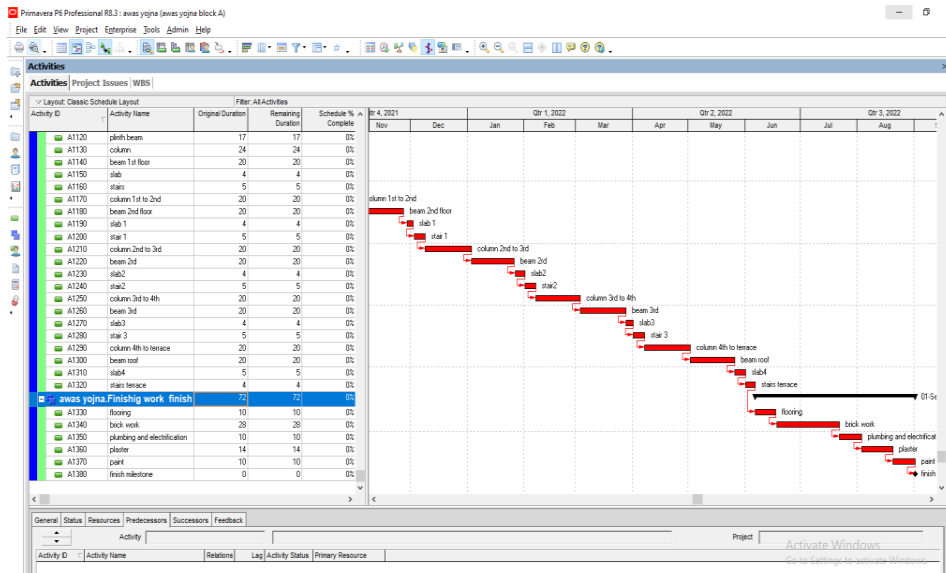


Figure 19 Gantt Chart of PMAY Block A

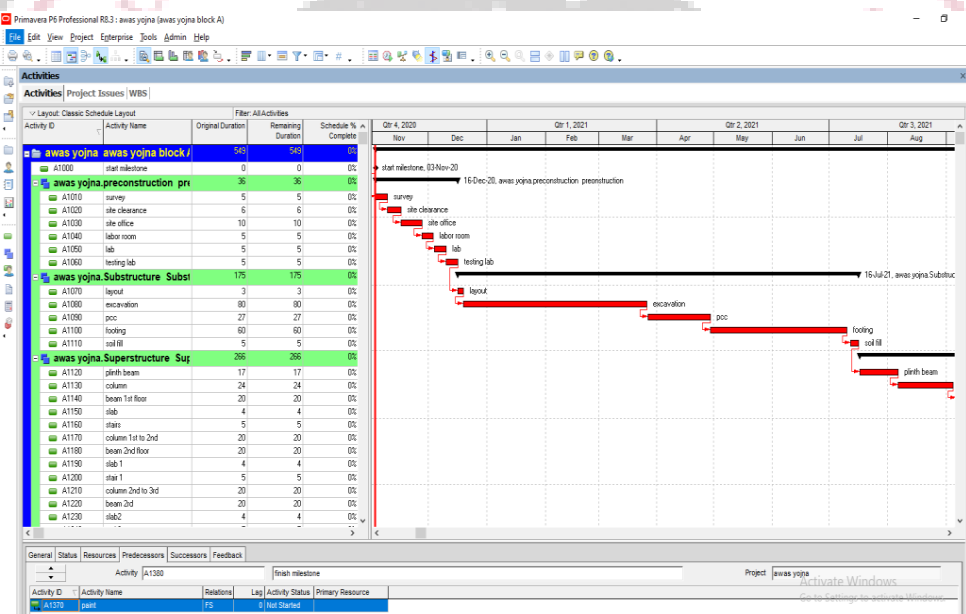


Figure 20 Gantt Chart on PMAY Block B

Discussion:

The Gantt chart presented the appropriate dates which define the differences in implementation of resources starting from the stage first of site investigation which includes survey till the stage finishing work.

**Table 5.2 Schedule of PMAY Block A and Block B**

Activity		Block A		Block B	
		Start Date		End Date	
Survey Site investigation	Soil Testing	29-Oct-20	29-Oct-20	6-Feb-21	5-Jan-21
	Boring of Strata	23-Nov-20	5-Nov-20	21-Nov-20	30-Nov-20
	Site Office	15-Jan-21	29-Dec-20	15-Jan-22	5-Jan-21
	Machinery Setup	23-Jan-21	29-Dec-20	22-Jan-22	5-Jan-21
	Labour & Material Setup	30-Jan-21	29-Dec-20	30-Jan-22	5-Jan-21
Substructure	Excavation	6-Feb-21	5-Jan-21	22-May-22	24-Aug-21
	PCC	22-May-21	31-Mar-21	16-Jun-22	29-Apr-21
	Foundation	16-Jun-21	23-Apr-21	27-Aug-22	22-Jul-21
	Abutment	27-Aug-21	22-Jul-21	6-Oct-22	3-Sep-21
Superstructure	Pier	6-Oct-21	4-Sep-21	24-Jan-22	29-Dec-21
	Slab	24-Jan-22	16-Dec-21	16-Feb-22	12-Jan-22
	Girder	17-Feb-22	12-Jan-22	8-Mar-22	3-Feb-22
	Beam Roof	8-Mar-22	28-Jan-22	14-Jun-22	5-May-22
	Staircase	14-Jun-22	5-May-22	25-Aug-22	18-Jul-22

## V. CONCLUSION

This research underscores the significance of adopting advanced project management tools, such as Primavera P6, in the construction industry, especially in large-scale projects. The study identifies challenges in the quality of schedules generated by the software and addresses the hesitancy among Indian contractors to embrace global planning practices. Through a comprehensive case study of the Pradhan Mantri Awas Yojana project, the research showcases the implementation of Primavera P6 in planning, scheduling, financial risk analysis, and resource management. The study provides insights into project maturity levels, development phases, and the efficient utilization of construction resources. The Gantt chart analysis visually presents the project duration and resource allocation, revealing insights for improvement and optimization in future projects. The research concludes by emphasizing the critical role of Primavera P6 in enhancing project management efficiency and suggesting avenues for further research in construction project management.

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