Resource Allocation Using Oracle Primavera P6

Simranjeet Singh[1], and Sakshi Bhatia[2]

[1] M. Tech Scholar, CED, RIMT University Mandi Gobindgarh, Punjab, India
[2] Asst. Prof. CED, RIMT University Mandi Gobindgarh, Punjab, India

Correspondence should be addressed to Simranjeet Singh; simranjeetsinghkhalsa84@gmail.com

ABSTRACT- Companies are currently involved in projects that are crucial to their performance as a result of market globalization and internationalization, which has increased competitive demands on businesses. These projects must be managed, planned, organized, staffed, monitored, controlled, and assessed in order to be successful. Primavera, a project management system, is a complete solution for professionally managing projects. This article gives an example of how to manage a project and allocation of resources using the Primavera software. One of the most critical management jobs is resource allocation, which enables strategy implementation. In businesses where strategic management is not practiced, resources are distributed based on personal or political considerations. However, in strategy-based companies, resources are allocated based on annual targets' priority. Failure to link executive plans and determine the priority in assigning resources to strategic long-term projects is one of the primary challenges to successful organisation strategy implementation. In order to achieve organisational goals, any organisation must allocate at least four types of resources. These resources include financial, physical, human, and technological resources.

KEYWORDS- Critical, Primavera, Crucial, Manage, Implementation, Allocate.

I. INTRODUCTION

Primavera was first introduced in 1983 by Primavera System Inc., which was later purchased by Oracle Corporation in 2008. Primavera P6 is an Oracle project, programme, and portfolio management software application [1]. It's a flexible, user-friendly tool for planning, managing, and executing projects and programmes. Primavera P6 is suitable for a wide range of programmes and projects, from small businesses to big capital projects. Primavera P6 from Oracle is the most recent version [2].

Oracle's Primavera P6 is the world's quickest, most powerful, user-friendly, easy-to-use, and most robust project and programme management software tool. Prioritizing, managing, scheduling, and planning can all be done in favour of projects that are located all over the world[3].

II. OBJECTIVES OF PRIMAVERA

It's a flexible, easy-to-use tool for planning, managing, and executing projects and programmes, as well as resource allocation. Primavera P6 is suitable for a wide range of programmes and projects, from small businesses to big capital projects [4].

Oracle's Primavera P6 is the world's quickest, most powerful, user-friendly, easy-to-use, and most robust project and programme management software tool. Prioritizing, managing, scheduling, and planning can all be done in favour of projects that are located all over the world [5].

In basic terms, it is a browser-based solution with role-specific capabilities to meet the demands of every project participant, stakeholder, and their duties and talents. The software focuses on project-based organisations activities in order to manage the whole cycle of projects and portfolios (involving all big and small projects of an organization) [6]. Companies use the Primavera project management technique to help them make better portfolio management decisions, assess project-related risks and opportunities, and determine whether they have enough resources and capabilities to finish a task [7]. This one-of-a-kind strategy gives the essential ability and capacity to implement and control projects in order to effectively complete projects within a certain time frame, within a specified budget, and with a predetermined quality level [8].

This sophisticated software comes with a plethora of project and time management features. The user can simply enter project and task data into a database and distribute it to managers for decision-making. Because the software is offered to project managers directly, it fits a variety of project manager needs in terms of plan formulation and control. In project-based organisations, a large number of projects is a major issue. Primavera is used by these firms to integrate, plan, and control all of their projects[9].

This software can help you define the project breakdown structure. This diagram depicts the organization's project in a hierarchical format. Then, to manage projects, EPS is defined [10].

A. P6 EPPM also Encompasses

- Planning and scheduling
- Optimizing organizational capacities and prioritizing projects

- Portfolio management
- Resource allocation, levelling and its management
- Mitigating the risks and issues
- Reporting and tracking the projects progress
- Sound decision making and team collaborations
- Reports on earned value performances and etc.

B. Following Objectives are Met Using this Software

- Making strategic decisions
- Precise control of time up to the end of project
- Identifying required resources, resource prioritization and estimation in long period of time
- Reorganizing projects based on new priorities without any negative influence on the quality
- Reporting during project accomplishment.
- Just-in-time announcement of critical situations

C. Key Features of Primavera Software

Let's look at some of the key features of Primavera Software as explained below:

1) Scheduling

Primavera P6 contains a variety of scheduling alerts and reporting features to guarantee that the schedule is filled in correctly, keeping the project on track and within budget.

2) Resource Management

Within Primavera P6, Project Managers can keep a close eye on resource usage and provide projections for changes in resource availability. Project managers determine whether additional resources inside Primavera P6 could be diverted to keep the project on track. The visualization tool in ERPM allows users to turn raw data into easily comprehensible and shared graphics.

3) Contact Management

Primavera allows organisations to maintain control over many projects or programmes. When a new project closely resembles a previous project, project managers can replicate information from the Oracle database in seconds.

4) Structuring of Project in Primavera

- Collecting the data from the organization
- Enterprise Project Structure (EPS)
- Add a project to the EPS hierarchy
- Creating Work Breakdown Structure (WBS)
- Add activities to WBS
- Define resources
- Assign Relationship to the activities of the Project
- Allocate Resources to all the activities of the Project

III. LITERATURE REVIEW

Unmesh Polekar (2015): author depict construction planning and testing operations in management work during the execution. Scheduling is completed in order to manage the time for each event or activity in the Project. The relevance of using Primavera to plan, schedule, and track a private project is to understand the relationship between the plan and the actual executed calendar. The most significant difficulty that arises during the course of a project's execution is an increase in cost and a lengthening of the project's completion time[11].

Sushant Pradhan (2016): has underlined those businesses have faced significant challenges in the past, notably in relation to certain operations. The information has been overburdened, the cost has been overestimated, the scope has been widened, and the resources have been over-allocated. Bringing about ill-advised project management in this mode. As a result, when managing such a wide range of operations, this study serves as a source of perspective. Three locations are being considered, and the work is being completed at the same time. Planning and scheduling are beneficial for future reference and project execution [12].

Satinder Chopra came to the conclusion that the Activity ID and Activity Description, two of the most underutilized parts of the calendar, may considerably improve the quality of the schedule if used appropriately. It is the responsibility of the planning team to settle on the Activity ID structure in advance so that schedule preparation runs smoothly and without problems. Additional investigation into how other fields, such as the original duration, remaining duration, task bars in the Gantt chart, and start and finish dates, might be displayed to give the user the most comprehension for effective schedule development [13].

P. Esaki Thaana: found time management system is believed to play a critical function in the organisation, as it is accountable for completing the project on time. The construction business has serious issues with schedule and cost performance. Primavera P6 software is used to manage and control time.[14]

IV. RESOURCE ALLOCATION

Assigning the right individuals to work on the tasks required to finish the project is characterized as resource allocation. Primavera P6 allows you to build and assign labour, material, and equipment resources. The "Resource Assignments" window displays the allocation and distribution of resource quantities[15]. It aids in the most efficient and cost-effective assignment and scheduling of available resources. Resource allocation is critical in project management because it provides a clear picture of the quantity of work that has to be completed. Resource allocation enables you to select the finest available resources for your projects and manage them throughout the project, ensuring that your staff are not overworked. Unfortunately, not all project managers take advantage of it. To execute the activity, you'll need guys, equipment, and materials. The majority of the activities necessitate the use of numerous resources; however, not all activities necessitate the use of multiple resources [16].

Curing, for example, is a resource-light activity. The efficient use of resources, such as labour, material, and equipment, is critical to the success of construction projects. Once the resources have been allocated to the activity, the project resources will be levelled to boost work efficiency and hence save costs . Resource levelling is the practice of reducing the daily resource need by changing the time at which a specific operation occurs without compromising the logic. A resource is assigned to each activity. Recognizing

the best available resources for the project, assigning them to your team, monitoring their workload during the project, and re-assigning resources as needed are all part of resource allocation. The effective utilization of resources available across the firm is increased by proper resource allocation, which maximizes their utility. Resource allocation enables you to select the finest available resources for your projects and manage them throughout the project, ensuring that your staff are not under or overworked. Unfortunately, not all project managers take advantage of it. Resource allocation aids in identifying the best available resources for the project, assigning them to your team, tracking their workload during the project, and re-assigning resources if necessary. The effective utilization of resources available across the firm is increased by proper resource allocation, which maximizes their utility.
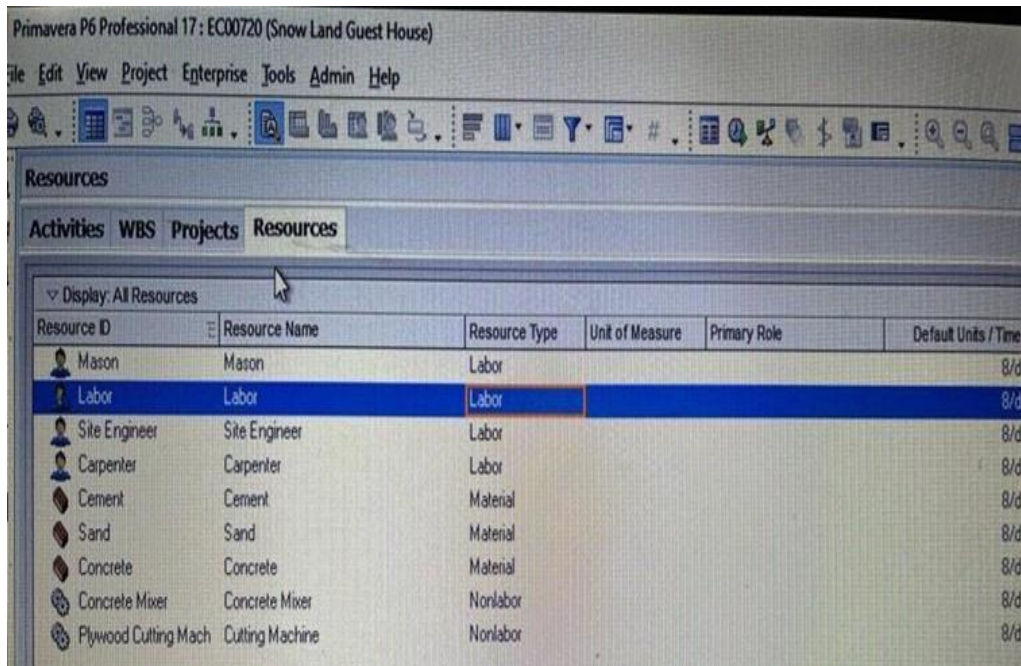

Figure 1: Resource allocation in Primavera

V. METHODOLOGY

- This Project mainly aims to achieve optimum resources utilization and resource leveling by using primavera software.
- To understand the importance of resource management technique.
- Using the PRIMAVERA software for Resource management.

A. The Methodology Includes

- Data collection
- Understand the data related resource levelling
- Learning the Primavera software
- Planning and scheduling
- Resource allocation
- Conclusion

B. How to Allocate Resources in the Project?

- Know the project and the team
- Uncover risks early on
- Keep track of the project
- Analyze the project

C. Benefits of Resource Allocation

As you can see, following the right processes and using a complete resource management tool, you can make resource allocation easier and benefit from it in many ways:

- It improves visibility of all the resources across the company
- You can avoid under and over utilization easier
- It helps to keep bookings more accurate.

D. Why You Need Effective Resource Allocation

Flexible for all size – large organisations may be working on several projects at the same time. Project managers can plan to assign resources to projects and manage them more effectively with effective resource allocation. So, whether you're working on one project or ten, if you're distributing resources effectively, you'll be able to handle them all without difficulty.

Save money – There is no waste of money when resources are allocated effectively. It provides information about a project's team members' performance. As a result, it may be simpler for you to assign jobs to resources based on their abilities.

Boost productivity – It is the most important reason for deciding on resource allocation. If you complete a project or

task ahead of schedule without sacrificing quality, you will undoubtedly increase your business productivity. There will be no more time waste, extra attempts, or additional labour costs.

Improve Time Management – It is critical to understand how long it takes the resources to accomplish projects or activities in order to manage a project efficiently. There are moments when resources lag behind actual time. However, this lack can have a significant impact. The real estimate hours to perform the activities can be set by proper resource allocation.

Improve staff morale – You can identify who is ahead and who is lagging by spending resources correctly. In most circumstances, project managers are unable to determine which team member is giving it their all. However, if you allocate your resources wisely, you can see who is doing what, who is lagging or leading, and who is taking longer than the projected hour to complete a project.

E. Common Challenges of Resource Allocation

Resource management is prone to several challenges that you need to be aware of to properly allocate resources and manage them throughout the project.

1) Client Change

You may have already experienced how changes to the scope, timeline, or budget can affect project delivery as a project manager. It's the same with resource allocation: having an up-to-date resource calendar will allow you to quickly adjust resources as needed.

2) Availability of Resources

You should be able to use whatever resources available at your organisation when starting a new project. But what if your company is Working on numerous projects and you need to bargain with other project managers for the same resources?

Availability fluctuates, and you must keep an eye on it at all times to recognize dangers to your project's completion.

3) Project Dependencies

When allocating resources, you must consider project dependencies, which are a type of relationship between the project's tasks or activities. For example, some activities in projects can only be accomplished after others have been completed, therefore it's pointless to hog (hold too many) resources early on.

4) Project Uncertainties

Even though you've double-checked all the specifics before starting a project, agreed on the timetable, budget, and scope, there are always surprises. Resource management necessitates the ability to respond to project uncertainty by re-assigning or transferring resources from other projects.

5) Priorities Across the Company

If your organisation is working on numerous projects at the same time, you and your colleagues may have to share limited resources And work on them in a similar timeframe. However, even if you are able to agree on the resources you both require, one of the projects' objectives may shift.

VI. ENTERPRISE PROJECT STRUCTURE (EPS)

The EPS (Enterprise Project Structure) is a logical, coherent, hierarchical organisation of all of your company's projects. This is a representation of the company's operations. EPS features a Main/Root Node as well as multiple Nodes and Sub-Nodes that define the various fields in which this company operates. The EPS does not alter drastically or frequently after it is defined. It simply requires minor adjustments on occasion. The EPS is available to all Enterprise initiatives, both current and future. This is a representation of the company's operations. To represent work at your company, the EPS can be subdivided into as many layers or nodes as desired. An EPS node must be included in every project. The number and structure of EPS levels are determined by the scope of your projects and how you wish to summarize data. You can handle projects on different levels while still being able to roll up and summarize data at higher levels.

A. Creating Enterprise Project Structure

Select Enterprise >> Enterprise Project Structure from the drop-down menu. Then select Add. Place the new element in the desired location using the arrow keys. If you wish to start a new business, you should do so at the highest level possible, without any parent links. Then, as needed, build one or more nodes under this element. Give each new element the relevant IDs and names.

Figure 2: EPS in Primavera P6

The EPS of the project is "SNOW LAND GUEST HOUSE".

VII. CREATING W.B.S (WORK BREAKDOWN STRUCTURE)

One of the first tasks in constructing a project schedule in Oracle Primavera 6 is to create a Work Breakdown Structure. Activities are detailed at multiple WBS levels once a project's Work Breakdown Structure (WBS) is built. The work breakdown structure is a hierarchical schedule outline that outlines the main job stages. Each project has its own hierarchy of work breakdown structures (WBS). Headings and subheadings are separated from the WBS elements. The project's scope is defined by the WBS. In project

management, a work breakdown structure (WBS) is a strategy
for finishing a complex, multi-step project. It's a strategy for breaking down large projects into smaller chunks and completing them more quickly and efficiently. The purpose of a work breakdown structure is to make a complex project more manageable Primavera Work Breakdown Structure feature enables to create and organize the hierarchical breakdown of the work packages of a project.

A. The W.B.S of the project is as under

- Grading
- Foundation
- Structure
- Framing
- Roof
- Interior
- Electrical
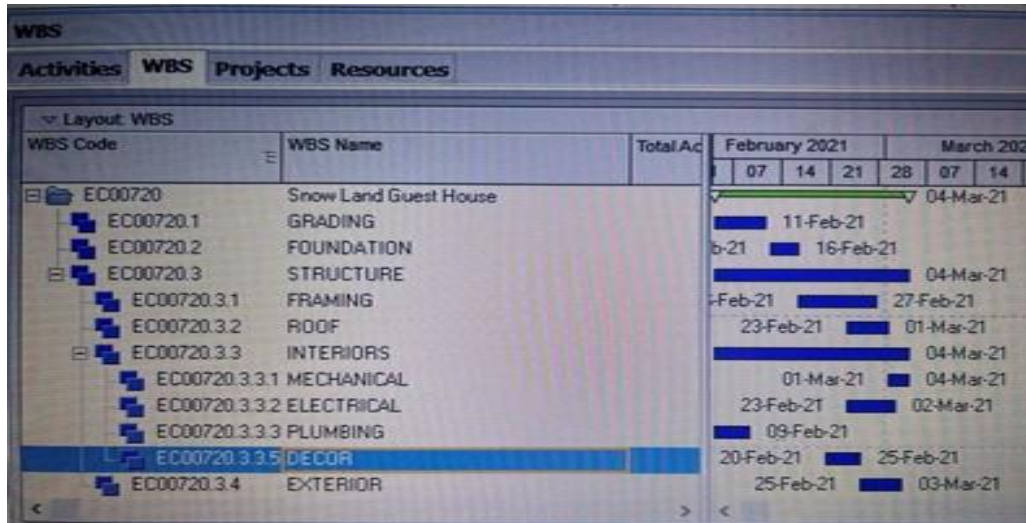- Plumbing
- Décor
- Exterior

Figure 3: WBS in Primavera P6

VIII. ACTIVITY

We'll put activities under the proper WBS levels once we've developed our project's work breakdown structure (WBS) in Oracle Primavera P6. The major work parts of a project are activities. Create activities, insert activity durations, and link them with relationships to create a timetable. Activities are created, durations are inserted, and relationships are linked to create a schedule. Activities represent various items, works, and deliverables within a work schedule. Activities are the basic work elements of a project. An activity is also known as a task, item, or event. The tasks of a project are known as activities in Primavera P6. Activities, like other project and portfolio management programmes, share some basic characteristics:

- A name
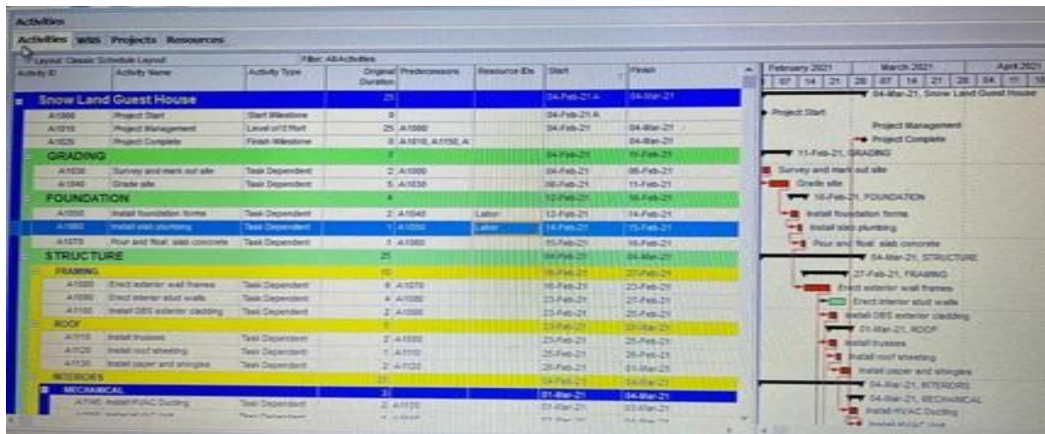- A start date
- A finish date

Figure 4: Activities in Primavera P6

IX. CRITICAL PATH METHOD

The critical path method (CPM) is a scheduling methodology for a group of project activities. The longest stretch of dependent activities is identified, and the time required to complete them from start to finish is measured to define the critical route. CPM is a deterministic model, which means it ignores the uncertainties that come with estimating the time it will take to complete a job or an activity. The amount of time it will take to accomplish each action can be anticipated based on previous experience or estimations from competent people. CPM is activity-oriented, which means that the network is constructed around activities. The critical route technique establishes a timeframe for the actions involved. It aids in the identification of a project's critical path and the estimation of project length. The crucial path is the longest (in terms of time), and the duration of this path determines the project duration. Primavera is based on the CPM approach (critical path method).

A. From this report we will learn

- What is resource allocation.
- How to implement it at your organization.
- How it helps project managers in their work.

B. Results and observation

- The project completion date according to the planned schedule is 4 Mar-2021.
- The progress of the project and the estimated total duration is to be repeated and updated.
- The report of allocation of resources helps in cost and time saving which results in increase of economy.
- It provides an idea of arranging the required resources for their upcoming activity.
- It was observed that after planning and scheduling using Primavera P6 the time duration was reduced.

X. CONCLUSION

The study's major purpose was to learn more about the roles of planning, scheduling, resource allocation, and project progress control. The first and most important item we can acquire from effective Primavera planning is the project's start and finish dates. Each activity's resource allocation may be visibly reviewed, and resources can be adjusted and redistributed at any moment. Each activity's many resources, whether in the form of material, machinery, or manpower, can be assigned.Currently, owners of large firms and contractors oversee and coordinate multiple engineering and construction projects at the same time. Insisting on completing the project on time, taking into account financial constraints, and maintaining a competitive market position led to an increase in project management knowledge application. As a result, project managers must transition from a traditional organisational structure to a simple and efficient multi-project organisational structure (Armstrong,2005). More than ever, businesses must rely on superior software knowledge.

After carefully studying this software one can easily control the project in terms of duration, hence leading to cost optimization.

REFERENCES

[1] Umesh Polekar & Rohit Salgude, "Planning, Scheduling and Tracking of a residential Project using Primavera Software". International Journal of Research in Engineering and technology eISSN: 2319-1163 volume 3, Issue 5, May 2015.

[2] Sushant Pradhan & Vijay K, "Planning, Scheduling and Resource Optimization of Multiple projects using Oracle Primavera P6". International Journal of Research in Engineering and technology eISSN: 2319-1163.

[3] Satinder Chopra, Developing and Efficient Schedule in Primavera P6: significance of Activity ID and Description, International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297:2007 Certified Organization) Vol 3, Issue 7, July 2014.

[4] P. Esakki Thangam, Planning, Scheduling and Time Management of Six lane Road Construction work using Primavera P6 software, International Journal of Science Technology and Engineering, Volume 3, Issue 5, May 2015.

[5] Ashlaghi, A & Taheri, S. (2010) .Designing an Expert System for Suggesting the Blood Cancer Treatment, health management , 13 term , Tehran .

[6] Armstrong, G., & Kotler, P. (2005). marketing: An introduction (7th Ed.). Upper Saddle River, New Jersey: Pearson Prentice-Hall.

[7] Raina, S.S., Singla, E.S. and Batra, D.V., 2018. Comparative analysis of compressive strength and water absorption in bacterial concrete. International Journal of Engineering Development and Research, 6(3), pp.281-286.

[8] Bhatta, D.P., Singla, S. and Garg, R., 2022. Experimental investigation on the effect of Nano-silica on the silica fume-based cement composites. Materials Today: Proceedings.

[9] Singh, P., Singla, S. and Bansal, A., 2021. Evaluation of Land Use and Land Cover Transformation and Urban Dynamics Using Multi-Temporal Satellite Data. Geodetski list, 75(3), pp.257-279.

[10] Kumar, A., Singla, S., Kumar, A., Bansal, A. and Kaur, A., 2022. Efficient Prediction of Bridge Conditions Using Modified Convolutional Neural Network. Wireless Personal Communications, pp.1-15.

[11] Singh, A., Singla, S. and Garg, R., 2020, November. Performance analysis of Papercrete in presence of Rice husk ash and Fly ash. In IOP Conference Series: Materials Science and Engineering (Vol. 961, No. 1, p. 012010). IOP Publishing.

[12] Ashraf, S., Kaur, S. and Singla, S., 2022. Water Quality Assessment of Anchar Lake, Srinagar, India. Civil and Environmental Engineering Reports, 32(1), pp.88-115.

[13] Ahmad, Uzair. (2018). A Study on Effect of Polymers on the Properties of Vg-10 Grade Bitumen. International Journal for Research in Applied Science and Engineering Technology. 6. 2572-2576. 10.22214/ijraset.2018.4433.

[14] Singh, J., Singh, B. and Singla, S., Enhancement of Expensive Soil by Addition of Stone Dust and LDPE Fibre.

[15] Singh, P. and Singla, S., 2023. Estimation of Land Surface Temperature of Srinagar City, India Using Landsat 8 Data. Sustainability, Agri, Food and Environmental Research, 12(1).

[16] Irshad, U and Singla, S.,2019 "Impact of Road Conditions on Traffic Management-A Case Study of Chenab Valley." International Journal of Scientific & Technology Research 8 1179-1186.