

Comparison of Microsoft Project, Oracle Primavera P6 and Asta Powerproject

1 Introduction

The three main scheduling and control software packages used in Australia in the building, construction and resources industries (BCRCs) are:

- Microsoft Project
- Oracle Primavera P6 and
- Asta Powerproject.

This document will discuss the similarities and differences amongst the products with the objective of assisting:

- People to understand the capabilities and disadvantages of each product and
- Companies to select the most appropriate product for their business.

2 Origins of Products

This section will outline the origins of the products which helps explain the structure and functionality of the products

2.1 Microsoft Project

Microsoft Project was developed in the US during for the management of the development of Microsoft software. It was put on sale in 1984 and was aimed at managing software development projects.

The functionality of the desktop software has not significantly changed since Version 2000 which introduced the ability for tasks to be assigned different calendars. Other functionality such as Cost Resources and the ability to name Calendar Exceptions have been introduced more recently.

2.2 Oracle Primavera P6

This was originally called Eagle Ray in the US in the 1990s and purchased by Primavera Systems. This again was developed for the management of software and business development projects, not aimed specifically at building and construction projects.

2.3 Asta Powerproject

Asta is one of the earliest construction project management planning and control software products and developed in the early 1980s in the UK.

It has a number functions specifically developed for building and construction projects.



3 Architecture

3.1 Microsoft Project

Microsoft project has three versions:

- “Standard” which is a desktop application and will only open a standalone file in single user mode that has been saved locally on a hard drive or on a server.
- “Professional” which is a desktop application which will either open a single file, in the same way as the Standard version, or it may download a file from a Microsoft Project Server.
- “Web App”, this is a browser-based application that will open a file from a Microsoft Project Server.

Most building and construction companies use the Standard version with their project files saved on a server.

3.2 Oracle Primavera P6

Oracle Primavera P6 will only open project from a database and will not open a single project file. P6 has used many database types in the past, but the latest versions will open projects from both an Oracle and Microsoft SQL database.

There are two types of P6 databases:

- Professional Project Management (PPM) database which only be opened by Windows Client and is the configuration used by most BCRCs. This database has no built-in integration options to other Oracle applications. This environment is aimed at smaller companies and standalone installations.
- Enterprise Project Portfolio Management (EPPM) database which may be opened by both the Windows Client and the Web Client. Administration must be undertaken in the Web Client and normally scheduling takes place in the Windows Client. This database type is aimed at larger companies because of the additional reporting facilities in the Web Client and has built in integration options for other Oracle software.

There are P6 two client applications that will send and receive information to and from a P6 database:

- P6 Windows Client which is used by almost all companies to create and update their projects and will open a PPM or EPPM database. The scheduling functions in the Web Client are not as quick or functionally rich as the Windows Client and most companies complete all their scheduling in the Windows Client.
- P6 Web Client which will only open an EPPM database. The web client is aimed at larger companies, has a large number of reporting/collaboration tools and has built in integration with a number of other Oracle products.

A majority of BCRCs use the Windows Client with a PPM database, but a few have recently started moving to the EPPM database with the option of both the Web and Windows clients.

3.3 Asta Powerproject

Asta power project has many options:

- It may open a single project file locally or from a server,
- Multiple users may open a project file,
- Multiple projects may be kept in a single project file, and
- Multiple projects may be kept in an Oracle or Microsoft SQL database.

Most BCRCs use Asta by opening a single project file locally or from a server.

Asta has a significant advantage because it has concurrent licenses and a free reader making it inexpensive to implement when compared to Microsoft Project or Oracle Primavera P6.

4 Industries that use each product

4.1 Microsoft Project

Microsoft project is mainly used by the following types of companies:

- Residential builders,
- Architects and Quantity Surveyors,
- Companies constructing small and medium commercial buildings, and
- Smaller civil construction companies.

Most companies that use Microsoft Project do not update their project files with actual dates to produce a revised end date.

4.2 Oracle Primavera P6

Microsoft project is mainly used by the following types of companies:

- Companies constructing large commercial buildings.
- Medium and large civil construction companies.
- Almost all resource companies in the mining, oil and gas industries.

There are many reasons why companies use P6 instead of Microsoft Project. One of the main reasons is that it forces schedulers to update a schedule properly by entering the Actual dates and reforecasting the end date of a project.

4.3 Asta Powerproject.

Asta has a small penetration in the Australian market because it was a later comer to Australia and it is not called up in contacts very often.

Companies that use Asta tend to be:

- Companies that do not have to exchange project schedule files with other companies such as builder developers.
- Large commercial construction companies who see the additional Asta functionality aimed at the construction industry of benefit.

5 Advantages

5.1 Microsoft Project

Here are the advantages of Microsoft Project:

- It is the most common software package used by BCRCs thus it is usually simple to exchange schedule files between companies.
- IT companies find it very simple to deploy as it is Microsoft desktop package.
- It is approximately 1/3 of the price of P6.
- Many people are familiar with it due to its market penetration and it is often taught at educational institutions.
- It is simple to create a project schedule with Microsoft Project because it is very similar to Excel and most users find it very intuitive.

5.2 Oracle Primavera P6

The main reason why companies move to P6 are:

- After Microsoft Project it has the next highest penetration in the market thus making it simpler to find trained operators.
- P6 forces users to update a project schedule properly ensuring all complete work is in the past and incomplete work is in the future.
- P6 is far easier and quicker to update a schedule than Microsoft project, when one is required to properly update a schedule.
- The ability to record an unlimited number of baselines which are complete copies of the current project and the ability display up to 4 baseline bars against one current schedule.
- It calculates the **Actual Duration** from the **Actual Start** to the **Data Date** or **Suspend Date** and a change to the **Duration % Complete** does not change the **Actual Duration** only the **Remaining Duration**.
- It always schedules incomplete work into the future.
- It allows four relationships between two activities making creating a Close Network simpler than Microsoft Project

5.3 Asta Powerproject

Asta Powerproject has many more scheduling options and functions than either P6 or Microsoft project and to list a few:

- The cost of Asta may be lower than other products due to the availability of concurrent licenses and a free reader for those people not scheduling projects. Powerproject changed their license structure in late 2023.
- Many scheduling options to allow the imitation of either Microsoft Project or P6 scheduling algorithms. Thus, Asta will force complete work into the past and incomplete work into the future, if you wish it too.
- Unlimited Baselines and up to 10 Baselines may be displayed in the Gantt Chart.
- Baseline schedules may have a name and description assigned.
- View all Baseline data, including each resource properties and relationships, from the current project.
- Partial baseline are permitted.
- Display the Baseline Critical Path on the Gantt Chart.
- Drive task durations by quantities and quantity per time period.
- An unlimited number of links between activities, allowing a partial critical path through activities.

- Leads and Lags calculated on the predecessor and/or the successor, not on the relationship allowing a choice of using the predecessor or successor calendar for the calculation of lead and lags.
- Link categories enabling links to be formatted and turned on or off, this in turn allows multiple build options in one schedule.
- Relink around completed tasks option.
- Multiple splits in the past and future.
- Task Snapping, to keep remaining durations to round day or half days.
- Task Start on new day, so large concrete pours do not start one hour before the end of the day.
- The ability to schedule part of a project.
- Multiple undoes, even after scheduling.
- Multiple Report Dates (Data Dates or Status Dates) set at the start of the project.
- View resource bars.
- Colouring of Gantt Chart bars based on Codes.
- Income and expenditure.
- Update resources and costs in Gantt Chart columns.
- The ability to model mining and earth moving operations using resources for the mobile equipment with the Task Work function to manage the material quantities.
- The display of each task non-work time behind or on each bar, therefore each task is displayed with its own calendar.
- Three different timescale scales, similar to the SureTrak function, except each Gantt Chart time slice may have its own scale.
- The ability to open and save to P6 XER and Microsoft project XML files,
- The ability to keep all projects in a database or as a file.
- Multiple projects per file.
- Multiple users per file.

6 Disadvantages

6.1 Microsoft Project

Most companies start with Microsoft Project as their scheduling tool, but below are the main reasons why companies stop using MSP include:

- The MSP Blank Project template has a number of issues and schedules created with it are difficult to manage. This is because the calculation options are not ideal, and it does not display the Status Date when it is assigned. There are a number of other presentation issues such as the Legend displays irrelevant bars and there is no header or footer text. Companies are advised to create a template using the Eastwood Harris template found at www.eh.com.au.
- MSP only supports one relationship between two activities, thus making it difficult to create a closed network. P6 supports a maximum of 4 relationships between two activities and Asta an unlimited number which both allow ladder scheduling.
- It is not possible to have calendars with a different number of hours per day in MSP and end up with the correct duration in days. This is because there is only one factor to calculate the duration in days in MSP and this factor is used for all calendars. P6 and Asta have a factor for each calendar.
- Projects with multiple resources and multiple calendars are difficult to manage due to the way MSP changes durations when resources are assigned. This is because the Resource Calendar takes priority over the Task calendar and several settings have to be changed to

prevent a resource calendar from driving the end date. Resource calendars are simple to ignore in P6.

- Earthworks and mining operations in older products like P3 and SureTrak were easily modelled by assigning a resource representing the material to be handled and mobile equipment resources representing the equipment to be used, then This is difficult to model in Microsoft Project because it is not possible to assign a Units per Time period as a production rate for a Material Resource and drive the Task Duration and mobile equipment hours
- Difficulty in modelling mining and earthworks productivity and mobile equipment with resources.
- A Baseline is only a partial baseline as it does not save the critical path, relationships, constraints. It records Start, Finish, Work, Costs and Duration.
- The management of multiple Baselines is difficult as MSP Baselines may not be named. There are 11 Baselines and only the date that the Baseline was set on is saved in MSP. Both Asta and P6 allow multiple Baselines and notes on each Baseline.
- The MSP **Finish Variance** column only works with the baseline selected in the **File, Options, Advanced, Baseline for Earned Value calculation**, thus variances may only be simply displayed for one baseline.
- It is difficult to display multiple Baseline bars.
- The way MSP manages in progress tasks is less robust than P6 or Asta and it is very simple to end up in an illogical situation where complete work is in the future and incomplete work in the past. P6 will not allow incomplete work in the past as it always moves it into the future, but it is possible to enter Actual dates in the future with P6. Asta has a simple function called "Straighten the Report Date" that moves incomplete work into the future and incomplete work into the past. There are numerous MSP functions to assist in updating a schedule, but these are all quite difficult to understand and master.

6.2 Oracle Primavera P6

P6 is graphically less powerful than most other and some of the scheduling issues with P6 are:

- The default Activity Views have a number of bar formatting issues and they all need to be reformatted to ensure Baselines and relationships are displayed correctly in the Gantt Chart.
- Scheduling does not schedule Actual Start dates set in the future back into the past.
- Users must always show the time to ensure constraints and actual dates are not entered at irrelevant times. When the time is not displayed activity Actual Start dates, Actual Finish dates and Constraints are often set at midnight and actual durations are calculated incorrectly.
- Only limited Baseline data may be seen from the Current Schedule. The following types of data may not be read from a baseline:
 - Baseline Resource Costs and Units may not be read. When reading a baseline, the resource values are summarised by Resource Type.
 - Baseline Resource Type Units for Labour and Nonlabour may be read but not read for Material and Expenses.
 - User Baseline 2 and 3 show only dates and no duration or resource information.
 - When multiple users are opening a schedule the User Baselines have to be set by each user to ensure that all users are reading the same baselines.
- The inability to create multiple splits in the past and future, but may be achieved by either:
 - Assigning a calendar to an activity and necking the activity bar to show non-work periods, or

- Creating multiple activities to represent the splits. The disadvantage of this is that only the first activity has a baseline. The option adding multiple new activities to represent the splits and converting the original activity to a LOE with the intention of leaving the Baseline with the LOE does not work because P6 does not read the original baseline dates once an activity type is changed to a LOE.
- P6 has **Planned Dates** fields that may contain irrelevant data once a schedule has been updated. The Planned Dates are displayed as baseline dates when a baseline has not been set and these **Planned Dates** often lead to a great deal of confusion.
 - The **Planned Dates** are displayed as baseline bars when no baseline has been set, and
 - The **Planned Dates** may also be read from a Baseline schedule when the database Earned value options are not configured to prevent them being read.
- It is graphically weaker than other products and unable to display:
 - Free float bars,
 - Different non-work time in different layouts,
 - Graphics on the Gantt Chart,
 - Individual bars colouring,
 - Resource bars,
- Difficulty in modelling mining and earthworks productivity and mobile equipment with resources.
- Date and time formatting is per user and the setting selected are applied to all data in all windows. Thus each user opening a project may easily display data in different formats.

6.3 Asta Powerproject

Disadvantages of Asta Powerproject

- Asta Powerproject does not have a high market penetration in Australia and often contracts specify a scheduling software such as P6 or Microsoft Project which have a high market penetration, thus making Asta Powerproject less likely to be nominated in a contract.
- It is difficult to find people who know how to operate Asta Powerproject
- Asta Powerproject has many more scheduling options and functions than either P6 or Microsoft project and as a result takes longer to learn. Some of these issues may be overcome by the creation of templates and writing of procedures for users to follow.
- User defined bars may not be created and formatting of total and free float is weaker than other products.

7 Summary

It is difficult to produce a summary of three very different products but this is how one might summarise the three products:

7.1 Microsoft Project

A software package that is simple to create schedule but difficult to use manage projects due to the complexity of updating a schedule properly. It lacks some basic functions such as creating a baseline that is a full copy of a project, the ability to use calendars with different hours per day and the ability to assign two relationships between two tasks to name a few of the more important ones.

7.2 Oracle Primavera P6

The great advantage of P6 is the ability to handle massive amounts of data and its robust scheduling engine. The Planned Dates and the way baseline bars are displayed when no baseline has been set is a major issue. When an organisation has untrained users and an administrator who does not understand the software, then the Baselines may display irrelevant data. P6 also does not have the ability to read all the baseline data which results in reporting progress against a baseline quantities and costs difficult and often results in data being exported to a third party reporting tool. It is graphically weak and without the ability to display different non-work time in different Views, inability to place graphics on Gantt Charts to name a couple.

7.3 Asta Powerproject

Asta is the last to market in Australia and has a low market penetration, thus there are not very many trained operators. It is designed for the building and construction industries and has many more functions than both Microsoft Project and P6. This feature is a double-edged sword as one can do many more things with Asta than either P6 or Microsoft Project, but it also takes more time to learn. This is a professional scheduler's tool with very robust algorithms.

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