



Course Summary: Fundamentals of Project Controls



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An introduction to project controls theory and methodology for both project and on-going operational purposes.

Course Aim

The aim of this training is to provide the candidate with the principles and tools which are essential for building a robust and reliable project plan.

Learning Outcomes

By the end of this training the candidate should be able to:

1. Explain the difference between project and operational planning and the different techniques required for each
2. Use Critical Path Analysis to assess the project completion date
3. Analyse and manage the resource requirements of the plan
4. Compare and contrast the planned with the actual performance for controlling the plan during execution

1. Introduction to Project Management

1.1. Benefits of Integrated Planning and Control

The project team is responsible for developing a plan which will allow the project to be tracked and controlled ensuring that the goal and objectives are met. This requires accurate and timely information to be supplied to, and also from, the planning and control system. Even though this can often be viewed as an overhead to the project, it should be noted that an absence of this information can lead to greater expense for the project; particularly if it leads to poor management decisions, mistakes, rework and overruns.

1.2. Project Management Theory: The Project Life Cycle

The Project Management Institute (PMI) has created a process to assist with the successful execution of projects, especially when they vary in complexity and scale. This process is called the Project Life Cycle and consists of a number of recognisable, interrelated and dependent phases. These phases are often known as:

1. **Concept and Initiation:** establishing the need/opportunity of the project using a feasibility study.
2. **Design and Development:** creation of the way forward for the project, including detailed time, cost and resource plan.
3. **Execution and Control:** executing and controlling the project using the detailed schedules created in Design phase.
4. **Closing the Project:** confirms the project has been implemented according to the goal and objectives established in Concept phase.

2. Project Planning

2.1. Benefits of Integrated Planning and Control

There is no one, hard and fast definition of what a project is, for example the Project Management Institute (PMI) definition is:

“A project is a temporary endeavour undertaken to create a unique product, service, or result.”

(Project Management Institute, A Guide to the Project Management Body of Knowledge, 4th Edition, 2008, pg. 5)

While Wysocki's definition is a more expanded:

- Sequence of Activities
- Unique Activities
- Complex Activities
- Connected Activities
- One Goal
- Specified Time
- Within Budget
- According to Specification

(Wysocki, R.K., Effective Project Management: Traditional, Agile , Extreme, 5th Edition, 2009 pg. 6 - 8)

2.2. Develop a Work Breakdown Structure (WBS)

Work breakdown structure is vitally important for managing the project, and should be one of the first pieces of information created by the project team. Even if it is later decided that a project schedule is not required, a WBS will always be useful.

2.3. Define of Activities

Activities are the smallest component of the work package necessary to complete the scope of the project: otherwise known as tasks, operations, items or jobs. Each activity must be given a unique identifying number and description which is easily understood by all in the project team.

2.4. Use of Calendars

Calendars can be created for and assigned to each resource and each activity. Calendars define the available work hours in each calendar day.

2.5. Use of Constraints

Constraints are limitations placed on the schedule which cannot be derived through relationship logic; these limitations are enforced by the requirements of the project.

2.6. Build Logic and Relationships

A schedule is not made up only of activities, but of strings of activities linked together in logical sequences. Graphically represented in a Network Logic Diagram:

Series Activities are performed one after the other: successors following predecessors
Parallel Activities mean they can be carried out at the same time

- **Finish-Start (F-S)**
- **Start-to-Start (S-S)**
- **Finish-to-Finish (F-F)**
- **Start-to-Finish (S-F)**

2.7. Define Resources

There are three (3) categories of resources:

- **Labour:** measured in units of time and re-used between activities/projects
- **Non Labour:** measured in units of time and re-used between activities/projects
- **Material:** measured in units other than time and not often re-used between projects

3. Format and Report the Data

3.1. Layouts

It is important to remember that every project is unique, the implication of this being that different data and reports may be required. For this purpose, P6 has the ability to generate and save multiple layouts or "views" which change the appearance of the screen to suit the different project requirements.

3.2. Columns

The Columns function provides the flexibility to create and customise layouts by adapting the Activity Table to show more or fewer columns. This functionality is applicable in all windows: Project, Activity and Resource.

3.3. Bars

The Bars function provides the flexibility to create and customise layouts by adapting the bars shown in the Barchart area of the screen. This functionality is applicable in the Project and Activity windows.

3.4. Activity Codes

Activity codes and values enables filtering, grouping, sorting, and reporting activity information according to organisational or project requirements.

3.5. Filters

Filters state the criteria with which activities are displayed, allowing for emphasis to be placed on certain activities.

3.6. Group & Sort

The Group and Sort function provides the flexibility to create and customise layouts by organising the data. This functionality is applicable in all windows: Project, Activity and Resource.

4. Critical Path Analysis (CPA)

CPA is a technique which analyses the project schedule to compute those activities which are on the critical path: meaning where the duration of those activities drives the duration, and therefore completion date, of the overall project. It is important that these critical activities are monitored and controlled throughout the life cycle of the project as any delay will impact on the finish date of the project.

5. Baselining

A baseline plan is a copy of the original plan which was made just prior to executing and progressing the plan. This baseline is then used as a benchmark to measure against for the project's time, cost and resource performance.

6. Generate Reports

Project reporting should not be limited to only a gantt chart, and the database feature of Primavera allows for the generation of project specific reports relating to, for example WBS, Activities, Resources, Assignments, Notebooks, either in total or distributed over time. These reports can be published in either Word or Excel formats.

Creating reports in Primavera often involves some trial and error to generate the exact report required. Below is an example of how to generate a time distributed resource spreadsheet.

7. What is Operations Planning?

Operations are the on-going execution of activities which deliver the same product or service.

8. Acknowledgements

Project Management Institute: A Guide to the Project Management Body of Knowledge: PMBOK Guide, 4th Edition, 2008

Wysocki, R.K., Effective Project Management: Traditional, Agile , Extreme, 5th Edition, 2009

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