

Changing task dependencies

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Produced by:

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www.projectlearning.net/project_mentor.htm

More useful tips and tricks can be found on the Project Learning blog:

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Changing task dependencies

Introduction

When you've created a project, why is it that you can't always make tasks schedule the way you want. Often, you want to overlap tasks or have gaps of inactivity between them. After all, that's how project tasks happen in reality. You've tried to drag task bars around, but this unfortunately applies (often unwanted) constraints. You've also tried to use different link types but these only seem to constrain EITHER the start or finish of a task. Often this is unacceptable as tasks either start too early or can finish too late.

These tips and tricks illustrate how you can dramatically change a project's schedule (and its critical path) with some straightforward editing of the familiar finish to start link.

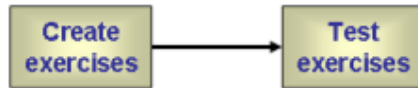
Background

Tasks within a project are linked to each other to create a network of interrelated tasks. This sequence of tasks determines the project's schedule, and also when work (from assignments against the tasks) can take place. This sequence of tasks can be edited (for example to make tasks overlap) and the project's schedule may consequently change.

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Dependency types

The simplest logical relationship is where the commencement of one task depends upon the completion of just one task that precedes it. In the example below, before the exercises can be tested, they must first have been created. A finish-to-start link exists between the two tasks (successor follows predecessor):



This finish-to-start is one of four possible dependency types, which are depicted as bars on a Gantt chart:

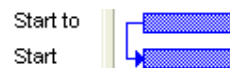
- Finish-to-start dependency, in which one task can not start until another task has finished.



- Finish-to-finish dependency, in which one task can not finish until another task has finished.



- Start-to-start dependency, in which one task can not start until another task has started.



- Start-to-finish dependency, in which one task can not finish until another task has started.



Hints

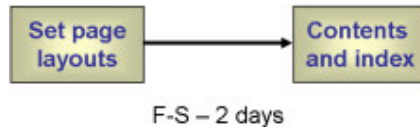
- Finish-to-start is the most common dependency type.
- Only one link is permitted between any two tasks.
- Avoid using too many complex links, it makes the project less manageable and the schedule more difficult to interpret.
- Changing the sequence of tasks can affect not only when tasks occur, but also the assignments that have been made against them.

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Making tasks overlap

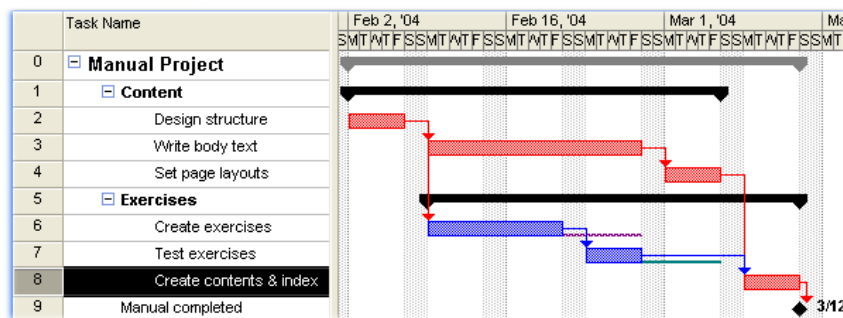
Tasks will often overlap one another. For example, a predecessor may not have to be complete before its successor can start. This can be achieved in a number of ways:


- Starting task B n days after starting task A.
- Finishing task B n days after finishing task A.
- Starting task B n days before finishing task A.

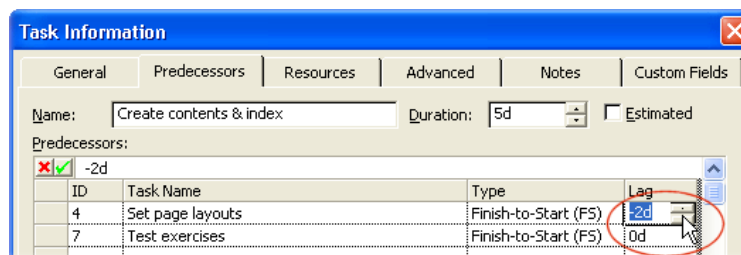


The dependency shown above states that: "Contents and index can start 2 days before Set page layouts is finished." To create this overlapping dependency between the two tasks:

- a) Select the successor task:

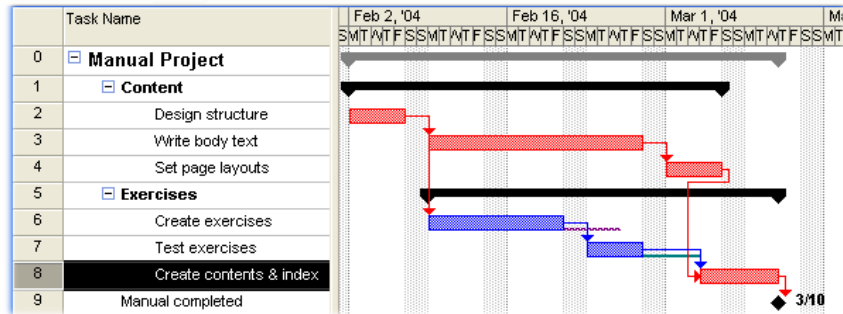


- b) Then click Task Information () and change the lag value within the Predecessors tab, confirmed with OK.



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c) Rescheduling the task bars thus:



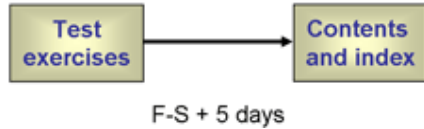
Hints

- A negative lag value is used to make tasks overlap. It is also known as a lead value.
- Lead values can be a percentage of the predecessor task's duration; for example to start task B once 50% of task A is complete.
- If link lines are displayed (set by an option button within the Layout dialog box), Double-Click on the link to edit it.

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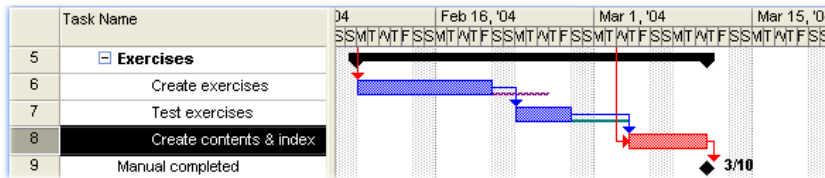
Using lags to create gaps


Sometimes there is a need to have a gap between the finish of one task and the start of another:



The dependency shown above states that "Contents and index can not start until 5 days after Test exercises is finished." To create this lag between the two tasks:

- Select the successor task:



- Then click Task Information () and change the lag value within the Predecessors tab, confirmed with OK.

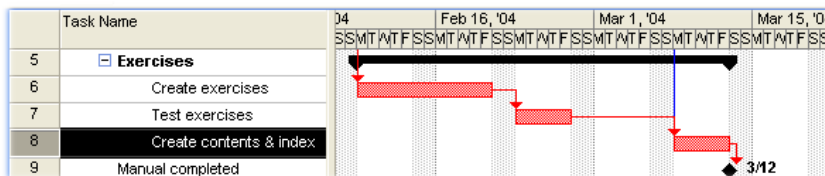
Task Information

Name: Create contents & index Duration: 5d Estimated

Predecessors:

ID	Task Name	Type	Lag
4	Set page layouts	Finish-to-Start (FS)	-2d
7	Test exercises	Finish-to-Start (FS)	5d

- Rescheduling the task bars thus:



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Hints

- Links, together with lag and lead values can be edited within a task form:

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How links affect a critical path

As links between tasks affect the project's schedule, they can also affect the project's critical path:

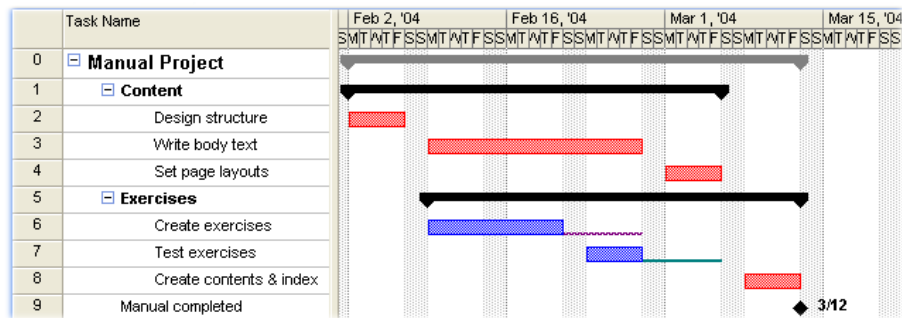
- Overlapping critical tasks can bring the project finish date earlier. Slack (float) values for non-critical tasks can also be reduced.
- Overlapping non-critical tasks can increase the amount of slack that they possess, although this won't have an effect upon the project's finish date.
- Gaps between critical tasks will extend the project's finish date, but slack values for non-critical tasks will increase.
- Gaps between non-critical tasks can reduce their slack values, possibly making them critical.

Changing the links within the Manual project has brought about a change to the critical path within it:

- Before:

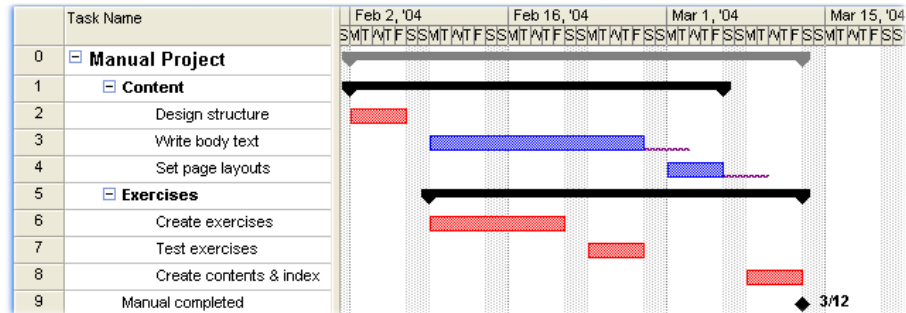
The critical path runs from: Design structure -> Write body text -> Set page layouts -> Create contents & index -> Manual completed.

- Create exercises possesses 5 days of total slack.
- Test exercises possesses 5 days of free slack.



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- After:
 - The critical path runs Design structure -> Create exercises -> Test exercises -> Create contents & index -> Manual completed.
 - Write body text and Set page layouts each possess 2 days of total slack.



Hints

- Slack (float) can be expressed on the Gantt chart using bar styles.
- Total slack and free slack values for each task are shown in the 'Schedule' table, together with late start and late finish dates.
- If the critical path runs down links (rather than through tasks), it can be difficult to visualize.