

How2guide: Scheduling

Introduction	When do you use this guide?
To develop the schedule, it is necessary to sequence the events that were defined during the Design process and put a timescale against each one. There are a number of dependencies that will need to be considered when constructing the schedule, namely: a. The relationship between outputs. b. What resources are being used (they can't do two tasks at once). c. Availability of resources, particularly specialists' e.g. legal d. What assets or services will need to be used to support the tasks, e.g. hardware for prototyping or test lab facilities? e. Governance constraints, EU procurement regulations or HR agreements. f. Non-negotiable deadlines, for example legal compliance.	This is to be used at the relevant points in the lifecycle established in framework. Within the lifecycle there are a number of management milestones which all programmes and project must plan to achieve. So the basis of the schedule is already in place. Between each of these milestones each programme or project will have a number of their own specific milestones that will need to be created as well. Prior to attempting to create a schedule, there should be a product breakdown structure in place. This will provide the basis for creating the critical path. This guide covers: • Identifying milestones • Critical path analysis • Gantt charts
Identifying Milestones A milestone is a point where an achievement has been reached and provides the opportunity to acknowledge and measure progress, whether late or early, it is a point at which the plan can be reassessed. The starting point is the lifecycle stages. Within each stage there are management milestones. Within the framework there are specific tasks listed that should be undertaken to assure that the milestone has been reached. Checklist for selecting a milestone. • The end of a project stage would be a milestone. • It will be a landmark, where there is a visible achievement, or a phase of work completes, e.g. procurement appoints the contractor/partner. In effect a significant output is delivered. • It is a point at where the project might change its focus, e.g. the building completes and the focus moves to moving people in. • A major decision or dependency that is required but may be outside the projects control – so it must be ready to proceed but will stop if the decision isn't there.	

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Milestones help to manage stakeholders' expectations and provide visibility of progress. This practice helps your organisation define a dashboard for all projects, identify the milestones that have been reached and those that are behind, and manage expectations of those that are involved in the project.

In this example there are milestones for a project moving through the Define stage. This example project is for a new service to provide grants, as it moves through the define stage; there will be the main dates, which show the achievement of the management milestone and the specific Technical milestones relevant to this project.

Management Milestones Define the outcomes	Main date	Technical Milestones	Date
Business requirements developed	15 th May	Existing operating model agreed Policy requirements confirmed Relevant agency requirements Local Authority requirements	15 th March 30 th March 30 th April 15 th May
Options identified and analysed	15 th August	Market research completes Reference site reviews completed Outline budget set	15 th June 30 th July 15 th August
Preferred approach agreed	15 th Sep	Potential suppliers identified Supply chain consultation completes	30 th August 15 th Sept
Approval to continue to Design	30 th Sep		

This is the simplest and highest level plan that can be created.

Technique - Gantt Chart

Gantt charts are what most people associate with using a tool like MS Project. It takes the milestone plan and puts more detail on it.

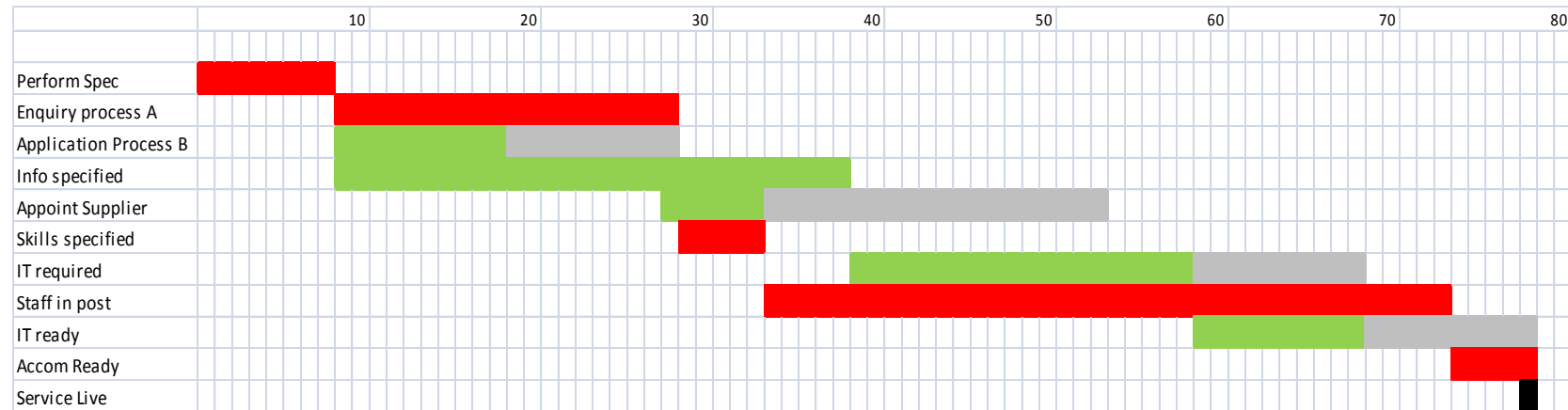
It shows graphical bars to indicate progress against each group of tasks towards milestones. It can illustrate the progress of teams working in parallel towards achieving target dates.

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A Gantt chart simply illustrates the tasks against the time line and can easily be created in a spreadsheet, Visio or MS Project. Creating the Gantt chart happens once the other steps of identifying and analysing the plan have been created.

This is the same project illustrated against a time line of days and created in Excel.

Gantt Chart:



Key: **RED** = Critical Path; **GRN** = Non-critical; **GREY** = Float

This Gantt chart is showing the same examples as the following section on Critical Path Analysis; it takes the example in the milestone plan about setting up a new service to manage grants and creates a timeline schedule.

Critical Path Analysis technique

Critical Path Analysis is a technique used to analyse what the project or programme will deliver; the dependencies between outputs; and work out a timetable which can be controlled. It uses the product based planning concept to work out how long the project will take and what cannot be changed to avoid slippage.

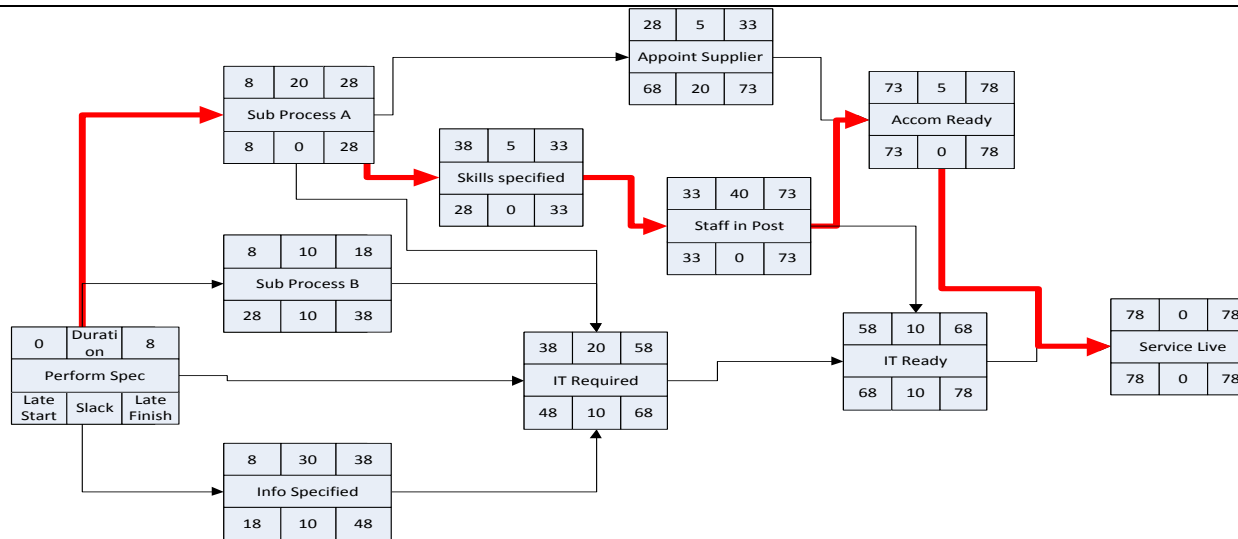
An estimates table that shows (days have been used for simplicity) the key information which is required for each task is simply:

- How long will it take (duration)?
- What is the task dependent on?

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Product	Depends On	Duration (Days)	The milestones may well be linked to the products that will be produced, so the milestone plan will be an input into the critical path analysis (CPA). This table explains how long each task will take and also how it depends on each of the other tasks. Using this table it is possible to calculate the earliest point at which the task starts and when it will finish. From this information we first draw the sequence. Then we conduct a forward pass to ascertain the project duration and finally a backward pass to calculate the floats. We can deduce that the minimum days that it will take to deliver the project will be 78 days. It is also possible to deduce what activities have no flexibility and those that have. By using the CPA concept, we simply map the information into our Product Sequence Diagram to work out the longest route through the project and identify the tasks that have float or slack associated with them.
Perform Specified	• None	8	
Grants enquiry process (Process a)	• Performance Specified	20	
Grant application process (Process B)	• Performance Specified	10	
Info Specified	• Performance Specified	30	
Skills specified	• Enquiry Process specified	5	
IT Required	• Enquiry Process • Application Process • Info Specified	20	
Supplier appointed	• Enquiry Process specified	40	
Staff in post	• Skills specified	40	
Accommodation ready	• Supplier appointed • Staff in post	5	
IT Ready	• IT Required	10	
Service Live	• IT Ready • Accommodation Ready	End	

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Earliest start time	Duration	Earliest finish time
Activity description		
Late start time	Total float	Late finish time

The boxes identify the earliest start date (dependent on other activities) and how long it takes, which then gives you the earliest finish time for the task.

To calculate the critical path, once the length of the project is known, work backwards with the latest finish time being the latest start time from the activities that are dependent on it. The 'float' is the difference between the Earliest Finish Time and the Latest Finish Time. Latest start time is the latest finish time minus the duration.

The activities with zero float represent the critical path for the project and should be managed intensively. The activities that have some float have slack that can be used to make sure that time isn't lost on the critical path.

Behind each one of these activities, there will be an Estimate Table that has led you to the calculation of the effort required. If any of the resources are deployed onto parallel activities you need to be aware of it, as it means that the activities must become consecutive or will need float to enable them to happen in the timescale.

The outputs of the critical path activities could be used for the project milestones.