**Registration Number:** NIxxxxxx

**Planning Guidelines**

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# Introduction

## Introduction

*The purpose of Project Planning is to* ***establish reasonable plans*** *for performing project work.*

It is recognized that scheduling and planning a software development is a difficult task, yet it is one that cannot be avoided, as customers require an indication of when deliverables will be produced in order to enable them to plan other activities in relation to the product, such as marketing, tech pubs and so forth.

The purpose of the schedule is to demonstrate that the product requirements can be implemented within a certain timeframe. This document is intended to help people tackle estimation and scheduling as coherently and professionally as possible, so as to avoid making rash, untenable commitments.

The process described herein will operate within the overall Feature Creep Delivery Framework, and principally apply to the *Definition and Planning Phase*.

## Scope

This document describes the preparation of schedules within Feature Creep. This document should be read by all people involved in the preparation, review and approval of a project schedule.

The procedures detailed in this document **must** be followed by all people involved in producing schedules.

## Terms and Abbreviations

FS Functional Specification

IOT Interoperability Testing

MRD Marketing Requirements Document

PAC Performance and Capacity

PDT Product Delivery Team

PPG Product Planning Group

PRD Product Requirements Document

QA Quality Assurance

QMS Quality Management System

SIT System Integration Testing

IVV&T Integration, Validation, Verification & Test

## Schedule Baseline

A project schedule **must** be baselined for tracking purposes and to evaluate the impact of changes on the project. However, an accurate schedule cannot be produced and baselined until all the requirements are known and the full scope of all the work required is known.

Therefore, a baselined schedule cannot be produced until after the PRD and Functional Spec are approved. Baselined schedules are a deliverable to the EPM at Gate 2 in the Product Release Lifecycle, at the same time as the Functional Specification

## Producing a Schedule

Project Managers will usethe **Product Requirements** as a basis for producing Schedule Plans. In most cases this will be in the form of an approved PRD, but in certain circumstances will involve discussions with Product Management and producing a draft Functional Specification.

The following process should by followed when preparing a schedule. It is often the case that the customer will mandate a delivery date. In such instances where a variable is constrained by the customer the following process should be followed regardless.

The process will vary according to the level of definition of requirements. Requirements may or may not be defined to a level where a task breakdown can be performed

1. The process to be used will depend upon the level to which the work package is defined. This level of definition may range from an approved and well defined PRD to a high level customer vision of what the system should do. The planner must ascertain whether or not it is possible, from the definition of requirements, to break the work down into distinct tasks which can be estimated for separately. In order that a useful task breakdown can be done some element of high level design is necessary. In addition, it is important to define what is to be delivered.
2. Where the customer requirements are defined to a level where the work can be broken down into discrete tasks, the effort in man-days, required to implement each task should be estimated. The figures must be input to MS Project Schedule Plan.
3. Any risks and assumptions made when calculating the effort should be recorded in the Risk Log for the project (normally part of the Product Delivery Team minutes)
4. It is naive to plan for an individual to work 7.5 hrs per day and 5 days a week. People take annual and sick leave, attend training courses and meetings etc. Allowance must be made for this 'ineffective' time. See Ineffective Time for guidance on factored in ineffective time.
5. The schedule is completed by summing the total estimated time.
6. The schedule should be reviewed and approved as detailed in section Reviewing the Schedule . Before the review it is useful to check the schedule against previous data gathered from previous similar projects - See "Comparison with Other Projects.
7. The approved schedule will then be used by the project planner and Product Delivery Team for tracking the overall work.
8. Where the requirements are defined to a level where a task breakdown cannot be done the estimator should do the following:-
	* Break the work into the tasks required to implement the requirements.
	* Estimate how long each task will take to complete.
	* Consult key colleagues with relevant estimating experience in work of this type. These key colleagues should be used throughout the estimation process in an advisory capacity.

It is important to note that the estimator may go through the following process more than once as requirements go from a high-level 'idea' of what the product should do, to an approved detailed PRD.

##  Reviewing the Schedule

All schedules **must** be formally reviewed. In addition to the estimator, the following individuals should attend the review:

* People experienced in the relevant technical area
* The Product Delivery Team leader for the project

After a schedule has been reviewed it **must** be approved and lodged on the project Team Site

The estimator must provide the following prior to the formal review meeting

* **Definition of work to be done**
The PRD for the project being undertaken
* **Completed Schedule Plan**
* **Documented Risks and Assumptions**
The planner must state clearly all assumptions which have been made in reaching the overall schedule. These assumptions may, for example, relate to design, people's availability, start date etc. If the schedule has been performed without an approved PRD then this must be made clear

People involved in the examination of a schedule should look for the mandatory contents above and also:

* Names of individuals who contributed to the production of the schedule;
* Comparison with schedules for previous similar work;

In some cases this approval mechanism may be deemed too stringent (e.g when estimating separately for many small components which make up the larger system).. Any such variation in approval process must be recorded.

The schedule may still be subject to change if customer requirements alter as a result of a Change Request.

From the above, it is apparent that an schedule is not a one-shot, 'cast in stone' item. As the customer requirements become better defined, the schedule will be revisited and will become more complete and accurate. Initial, incomplete schedules can still be marked approved. Approval in this sense means 'fit for purpose' and indicates that, at that time and with the information available, the schedule was correct.

## Ineffective Time

The raw man-day figures calculated in task breakdowns are not an accurate reflection of the elapsed time taken to complete the task. People are not 100% efficient and do not work on the task 7.5 hours per day, 5 days per week.

There are a number of contributory factors preventing an individual from working 100% of their time on an allotted task.

* Annual leave
* Sick leave
* Training courses
* Group Meetings
* Performance reviews and other 1:1s with managers and managed people
* Housekeeping tasks
* Support and input to other concurrent project

A developer needs to perform other tasks like the preparation of the software development, maintenance of the schedule plan, approving documents etc. In addition, a percentage of a manager’s time is taken up on the day to day management of the project team. The planner should allow for 10% of their time to be taken up on the management of a team member. Thus, half of a manager’s time should be taken up managing a team of 5.

These should be allowed for when producing the schedule plan.

##  Comparison with Other Projects

Comparisons with schedules and metrics from completed and related projects is a valuable aid to estimation.

Estimators should:

* Examine previous time and schedule metrics from similar work
* Consult with colleagues who have been involved in an appropriate project
* Seek advice outside the workplace if your project is in a new work area

The main aim is to identify any problems that resulted in a change / increase of project time scales..

##  Tips for Microsoft Project

A fundamental component of any schedule plan is showing the individual tasks and how those tasks are scheduled to be implemented from the time of project inception to the completion date.

There are several tools available to help the planner schedule tasks, manage resources and monitor costs for a software project., Microsoft Project is the one used in Feature Creep.

### General:

* + Planning tools are an aid to planners. It is important that the planner does not allow the planning tool to do everything. For example, Microsoft project, will try to plan everything with sometimes erroneous results - options such as automatic resource levelling should be avoided. In the production of any schedule plan there will be a lengthy, non-automated 'tinkering' stage where the planner manually adjusts resource allocation and task duration and ordering until they are satisfied that the plan is correct and realisable.
	+ When the numbers of tasks and resources are large, a great deal of time and effort may be needed to ensure a plan is totally correct. The estimator should not spend excessive amounts of time 'tinkering' with a plan to ensure 100% correctness.
	+ Most planning tools will identify the critical path for that schedule plan. Planners should pay particular attention to all critical path tasks throughout the lifetime of the project.

### Task Breakdown:

The individual tasks making up the work package will already have been identified at an earlier stage.

* + When inputting tasks to the schedule plan they should be grouped together under a high-level summary task. Summary tasks help provide structure to the plan.
	+ The level of task breakdown (or task granularity) is important. Too many short duration tasks will greatly complicate a plan. On the other hand planners should avoid, where possible, having only long duration, high-level tasks as these do not yield much information to the viewer.
	+ Milestones must be included in a schedule plan. Milestone information will be especially useful for the customer as they may only be concerned with the scheduled completion dates for deliverables and not the individual tasks that are needed to create the deliverable.
	+ To alleviate the need for further unnecessary task breakdown the estimator should use task description fields to describe the smaller components. For example, in Microsoft Project the Task Information field can be used to input this information.

### Task Ordering

* + The ordering of tasks within a summary task can be obvious. For example, in the production of a document the task breakdown will be draft, review and rework in that order and these tasks should be linked as such. However it is important not to link high level tasks as a whole. For example, traditionally design should not start until the requirements capture phase is complete. To order these two high-level tasks in a 'one must not start until the other is finished' link is naive and will reflect pessimistically in the schedule plan. When resource allocation is done it may become obvious that if this type of ordering is used, workers may be under utilised. Ordering and linking between tasks should not be done until resource has been allocated. The estimator can use lag and lead times to when ordering tasks to ensure phase overlap.
	+ As well as intertask linking, useful constraints can be placed on when a task starts or finishes. For example, in Microsoft Project, tasks can be made to
		- Start on a certain date
		- Finish on a certain date
		- Start as soon as possible
		- Start as late as possible
		- Start no later than a certain date
		- Start no earlier than a certain date

### Resource:

* + Plan for normal working hours. It is imperative that the estimator does not actively plan for resource being used for more than the normal number of working hours per day. To do so will undoubtedly produce unrealistic and unachievable timescales and will inevitably lead to discontent within the team.
	+ A resource's ineffective time can be catered for in various ways. For example, in Microsoft Project, generic resource calendars could be configured for every level of worker. A worker's calendar should have 'x' days blanked out per month for ineffective time where 'x' is dependent on the size and type of project. Manager’s calendars will have more days blanked out. If the individual is responsible for other work outside of the project (e.g. support for an old release) then time can be blanked out for these activities also. When blanking out ineffective time it is important that this is spread evenly throughout the month and not lumped together as this may radically affect the schedule plan. Alternatively, ineffective time can be put in the form of a continuous task running the length of the project.
	+ Annual leave and public holidays should also be planned in where possible. In Microsoft Project, for example, each individual worker should have a calendar where annual leave is identified. Public holidays can either be added to every individual's calendars or to the base calendar which applies to every resource. It should be noted however, that when schedule planning for an schedule, annual leave information may not be available as the estimator may not know the individuals who will work on the project.
	+ Over-resourcing occurs when an individual must work more hours than is possible to achieve the planned end date for the project. When over-resourcing occurs the estimator must revisit the schedule plan and rectify the over-resourcing. When the level of over-resourcing is small (e.g. the individual is planned in to work 10 hours in a particular day) then the planner should not waste time rescheduling tasks to bring the resource level down to the maximum. In all probability this comparatively low level of over-resourcing will be absorbed over the lifetime of the project.