Project Management Fact Sheet:

Developing a Gantt Chart

Version: 1.2, November 2008

Department of Premier and Cabinet

Tasmania
Explore the possibilities

What is a Gantt Chart?

The *Gantt Chart* is a horizontal bar chart. It shows the project activities and tasks in sequential order with the bars representing the time estimated to complete them. The chart graphically depicts the time relationship of activities, tasks, milestones and resources in a project. It is a flexible document and is regularly updated through the life of the project.

It usually includes:

- the major activities and tasks of the project
- the project milestones
- the interdependencies between phases/activities/tasks
- a unique identifier for each phase/activity/task
- a timeline
- the person or resource responsible for each item

Why would you develop a Gantt Chart?

A *Gantt Chart* is developed to:

- Assist in determining how long activities and tasks will take
- Assist in determining the relationship between items
- Identify the critical path – that is the shortest possible path from the first activity to the last. This is useful for determining the minimum time to complete the project
- Use as a baseline for reporting
- Assist with delegation and managing of team workloads
- Assist in determining how long the project will take, including in analysing the effect on the overall timeframe of activities going overtime

- Assist with identification of project risks by showing areas of uncertainty
- Assist with the management of risk by showing the effect on the project timeline of a risk occurring
- Confirm a common understanding of the project timeline among Project Sponsor, Steering Committee/senior management and Project Team

When would you develop a Gantt Chart?

The *Gantt Chart* is usually created at the start of a project and used as a baseline for future reporting. The chart is then regularly updated to realign future work with the remaining timeframe. It can also be created or updated at any time when the project timeline needs clarification, such as for a new project phase, to determine the effect on the timeline of a risk occurring or to add new work to the project scope.

What you need before you start

- An agreed Project Business Plan or Project Proposal or Brief
- Knowledge and understanding of the project
- Knowledge and understanding of the major activities in the project

Other References you may need

- Corporate/Business Plan for the Department/Business Unit
- *Tasmanian Government Project Management Guidelines*
- Departmental Project Management Guidelines
- The project Work Breakdown Structure (refer to the *Project Management Fact Sheet: Developing a Work Breakdown Structure*)

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What you will have when you are finished

A completed *Gantt Chart* that can be used for day-to-day management, planning and reporting. It may be useful to present to senior managers to clarify planning estimates, work required and timelines.

How to use the Table?

Table 1 is a simple table with project outputs and activities listed against a timeline. Project tasks, the sub-activities that need to be done to complete each activity, can also be listed, if required. The table can be used for a single output, or for all project outputs and the timeline can show days, weeks or months as necessary.

The second output listed (New Software Tool) and associated activities are given as an example. A spreadsheet or project scheduling software package can also be used to generate Gantt Charts (Table 2).

1. List the project work

List all the project outputs in separate cells down the left hand column. Insert a new row under each output and in it list all the activities that need to be done in order to produce the output. This is a high level Work Breakdown Structure for the project.

Note: If required you can also break each activity down into the smaller tasks and list these under each activity. If you have a completed Work Breakdown Structure then this can be transposed in full down the left hand column.

2. Identify resources

Next to each output and activity, in the Resource Name column, list the team member(s) or resource that will be responsible for delivery. Resources could be contractors, other Units, equipment etc.

3. Estimate timeframes

Use the remaining columns to create a timeline for the project. In the example given each small column represents a week.

Estimate the timeframe required for each activity. Using the timeline fill in the cells in each activity row from estimated start date to estimated completion date for the activity. Remember to take into account the level of input (eg a 2 day task would be completed in 4 days by an officer working at 50%).

Fill in the cells in each output row starting at the earliest start date of the associated activities, and finishing at the latest completion date. This shows that the output will be completed when all associated activities have been completed.

4. Identify milestones

The table shows project milestones, but not all Gantt Charts show these. Milestones are significant events that act as progress markers for a project. Their achievement is monitored and reported. Choosing appropriate milestones for a project is more of an art than a science.

Milestones are usually linked to the completion of a key project activity or key task. The completion of a project output is always a milestone. They can also be linked to funding or payments.

The number of milestones for a project depends on the reporting requirements. As a guide, for a project with monthly steering committee meetings there would usually be about one milestone scheduled per week.

Show milestones on the chart by adding a marker on the timeline such as a black diamond and the finish date, and add the description of the milestone in the activity list. Milestones are described in the past tense, for example 'team assembled', 'model developed' and 'lease signed'.

Note: A milestones is like toggle switch – it is either completed or not, it cannot be partially completed. The choices must be meaningful progress markers; the start of an activity or task is never a milestone.

Using the Gantt Chart

Project scheduling tools

Automated project scheduling tools can be used to manage Gantt Charts (Table 2), as a small change to the timeline for one task can affect the timing of many other tasks in the Chart, making it difficult to update and maintain manually.

Dependencies

Scheduling software can also show relationships between tasks, such as tasks that must be completed before a particular task can be started. These relationships are called *dependencies*.

There are four types of dependencies:

- Start-to-Start, where a task cannot start until the linked task has started

- Start-to-Finish, where a task cannot start until the linked task has finished. This is the most common type of dependency

- Finish-to-Start, where a task cannot finish until the linked task has started.

- Finish-to-Finish, where a task cannot finish until the linked task has finished

Some dependencies can also incorporate lag time, that is, time between the dependent events eg a task cannot start until ten days after a task has finished (eg tender evaluation).

Critical path analysis

The critical path is the chain of activities that link the start to the finish of the project, and for which any delay will cause the project to be delayed by the same amount of time. Identifying task

dependencies is essential in identifying the critical path for the project.

As a guide, a task will be on the critical path if changing the duration of the tasks changes the duration of the project by the same amount.

The critical path is, in effect, the shortest possible path from the first activity to the last and will show the shortest amount of time that the project could be completed in. Identifying the tasks on the path can assist in identifying which tasks should be given priority in order to keep the project on track.

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Table 1: Manually created simple Gantt chart

Item Name		Resource Name	Timeline 2008					
			Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**
1	**Output name**	**Officer's name**	▮	▮	▮			
1.1	Activity 1	**Officer's name**	▮	▮				
♦	**Milestone**: Activity 1 completed			♦23-2-08				
1.2	Activity 2	**Officer's name**		▮	▮			
1.3	Activity 3	**Officer's name**		▮				
1.4	Activity 4	**Officer's name**			▮			
♦	**Milestone**: Activity 4 completed					♦3-4-08		
2	**New Software Tool**	**Project Manager**	▮	▮	▮	▮	▮	▮
2.1	Plan the purchase	**Team Member 1**	▮					
2.2	Prepare the documentation	**Team Member 1**		▮				
♦	**Milestone**: Documentation Prepared			♦ 23-2-08				
2.3	Invite tenders	**Project Manager**			▮			
2.4	Receive tenders	**Team Member 2**			▮	▮		
♦	**Milestone**: Tenders received					♦ 17-4-08		
2.5	Evaluate tenders	**Evaluation Committee**				▮		
♦	**Milestone**: Successful tenderer decided						♦2-5-08	
2.6	Finalise contract	**Project Manager**					▮	
♦	**Milestone**: Contract sealed							♦28-5-08
2.7	Debrief unsuccessful tenderers	**Committee Chair**						▮

Where to get additional help

- Refer to the *Tasmanian Government Project Management Guidelines.*

- Further information and resources are available from
  www.egovernment.tas.gov.au

Acknowledgements

This Fact Sheet contains elements of the *Tasmanian Government Project Management Guidelines* prepared by the Department of Premier and Cabinet.