

Project Management Fact Sheet:

Developing a Work Breakdown Structure

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DISCLAIMER

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What is a Work Breakdown Structure?

The *Work Breakdown Structure* is a hierarchical breakdown of the work to be done in the project. It takes each output and shows in sequence, from general to specific, all the activities and tasks required for its production. As such the Work Breakdown Structure (WBS) also defines the scope of work of the project – whatever is not in the WBS is outside the scope of work for the project.

Why would you develop a Work Breakdown Structure?

A WBS is developed to:

- define what needs to be done in the project and the order in which tasks should be completed
- determine resource allocation and define tasks for delegation and the skills set required
- confirm a common understanding of the scope of work among Project Sponsor, Steering Committee/senior management and Project Team
- assist with the identification of milestones
- assist with the preparation of a Gantt Chart
- assist with budget estimation
- assist with identification of project risks by showing areas of uncertainty

When would you develop a Work Breakdown Structure?

The WBS is usually created at the start of the project, but may be created at any time when the work to produce an output needs clarification.

What you need before you start

- An agreed *Project Business Plan* or *Project proposal or Brief*, including a list of project outputs
- Knowledge and understanding of the project

Other References you may need

- Corporate/Business Plan for the Department/Business Unit
- *Tasmanian Government Project Management Guidelines*
- Departmental Project Management Guidelines

What you will have when you are finished

A complete WBS that can be used to plan resource allocation, determine the budget, create a Gantt chart, and determine milestones. It may be useful to present to senior managers to clarify planning estimates and work required.

How do you develop a Work Breakdown Structure?

A WBS can be created using any technique of listing and grouping project activities and tasks. It can be a resource intensive activity, depending on the level of detail required. This example uses a top down technique, starting with the project outputs and breaking these down into the activities that need to be completed to produce each output. These activities are broken down further into smaller tasks.

Another useful approach is to use mind mapping, either by using software or sticky notes. Write down each output on a separate note and brainstorm with the project team to find all the tasks that would need to be completed to deliver the output. Write these on separate notes and place around each output. The tasks listed will vary in size.

Try to break them into two levels: large tasks, or activities, and their associated smaller tasks. Move the notes around and keep adding more until a structure emerges, see figure 1. As a guide each output will have about seven activities, each activity will have about seven tasks. Tasks, activities and outputs can then be entered into the Work Breakdown Structure.

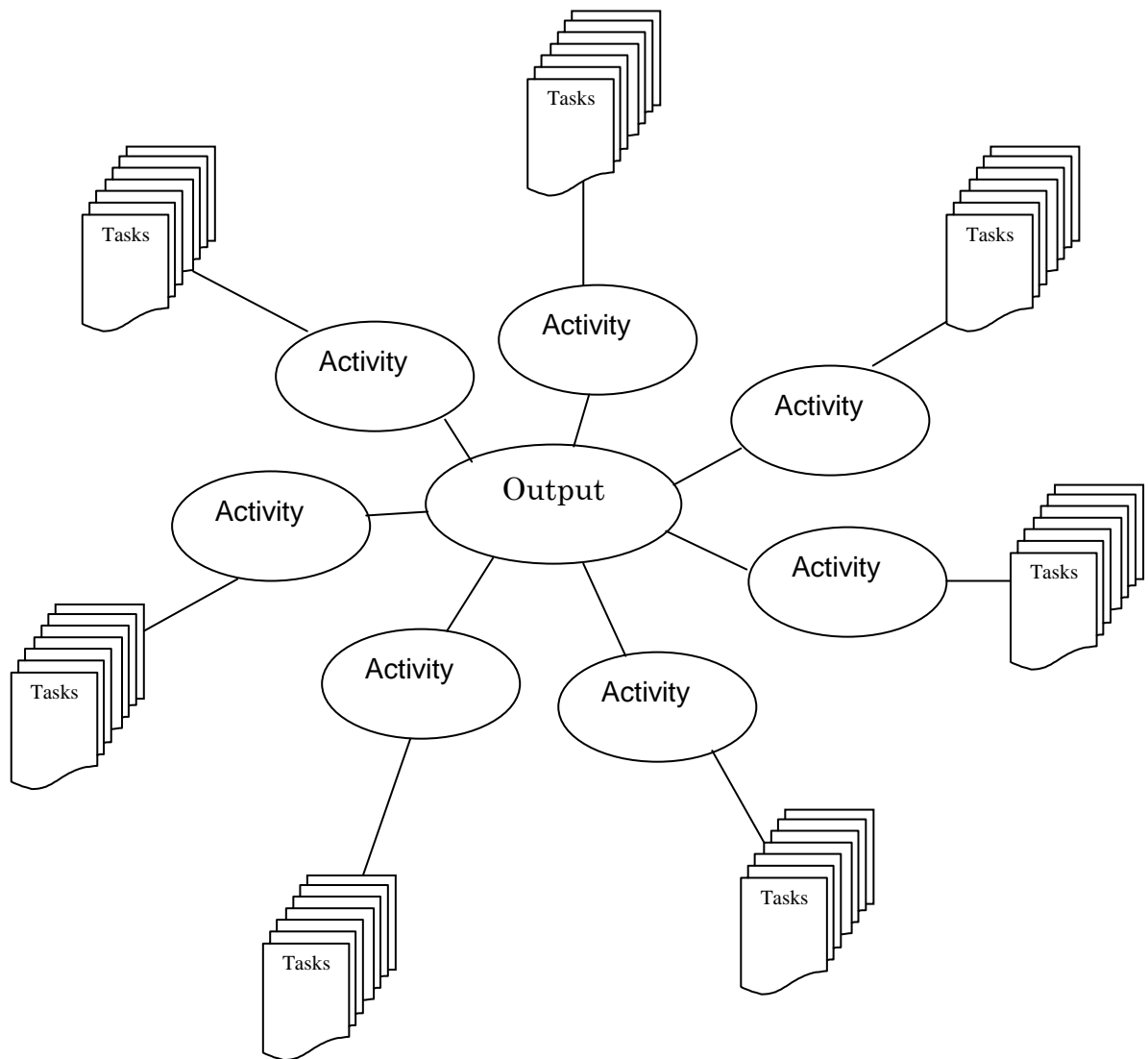
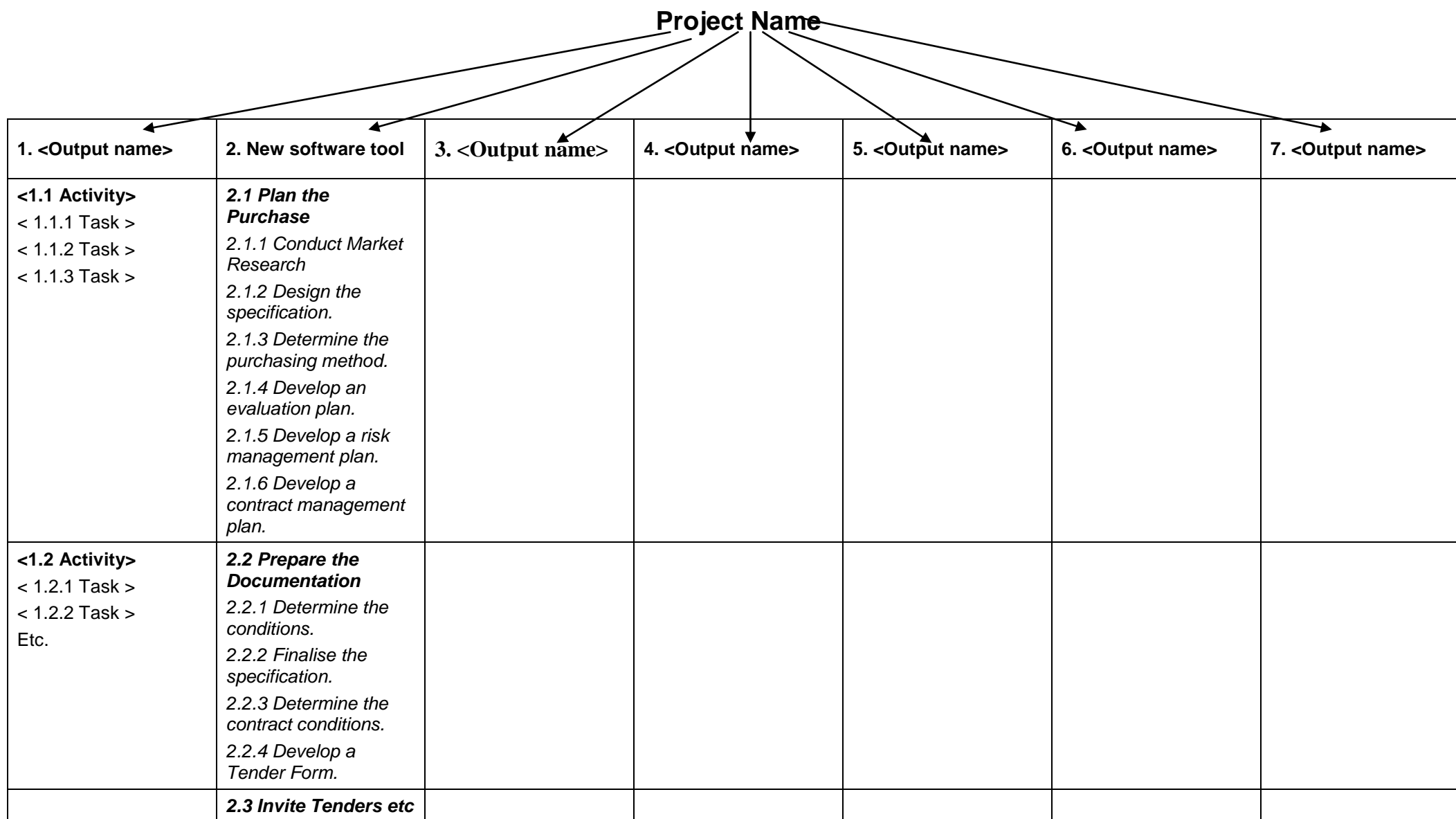


Figure 1: A mind map showing an output broken into seven activities and each activity broken into seven tasks.

Work Breakdown Structure - <Project Title>



How to use this table

The Table shows outputs, activities and tasks. Generally the project will need more than one page! The second column gives an example of the breakdown of one output into activities and tasks.

1. Write each output across the first row of the table. Use as many columns and pages as necessary. This is the output level.
2. Break each output down into sequential smaller units of work, called activities. These are all the things that need to be done to produce the output, in the order they need to be started. There are usually about seven activities for each output. This is the activity level.
3. Write each activity in a separate cell in the output column.
4. Break each activity into sequential smaller units of work, called tasks. Write these in the same cell as the activity. This is the task level.
5. Review the list to check that the activities and tasks seem appropriately grouped in terms of complexity. For example a task might be so complex that it needs to be considered as an activity, in its own right. This is simply a judgement call, there is no formula for determining at what level a unit of work should sit.
6. Check to see that completion of each group of tasks will result in the completion of activity above it. Check that the completion of each group of activities will result in the completion of the output above it. For example finishing all the activities that belong to the output will mean that the output itself will be completed. Move the activities and tasks around as necessary.
7. Finally, give each item on the list a unique identifier to use as a reference.

Note: Activities and tasks are written in the present tense using action verbs, for example 'assemble team', 'develop model' and 'sign lease'.

A number of different text styles have been used within the Table, as follows:

- Text in *italics* is intended to provide a guide as to the kind of information that can be included in a section and to what types of projects it might be applicable
- Text enclosed in <angle brackets> is intended to be replaced by whatever it is describing

Using the Work Breakdown Structure

Resource allocation

The WBS can be used to determine resource allocation, such as budget, in a process known as bottom-up estimation. This involves determining resources, including budget requirements, for each task on the WBS. The 'above the line' or project management activities will also need to be considered when using this approach. As a guide 'above the line' activities will take about 15% of the time of the project team. It is also advisable to include an allowance for contingencies; a guide level is 10%. (Refer to the *Project Management Fact Sheet: Project Estimation*)

Developing a Gantt Chart

A Gantt Chart is a horizontal bar chart. It shows all the project activities and tasks from the WBS in sequential order with the bars representing the time estimated to complete them. The chart graphically depicts the time relationship of activities, tasks, and resources in a project. It can also show milestones (see below).

It is a flexible document and is regularly updated through the life of the project. (Refer to the *Project Management Fact Sheet: Developing a Gantt Chart*)

Identifying project milestones

Milestones are significant events that act as progress markers for a project and their achievement is monitored and reported. The hierarchical structure of the WBS can assist in identifying project milestones as they are usually linked to the delivery of outputs or the completion of key project activities. The Gantt Chart can be used to identify milestone dates. (Refer to the *Project Management Fact Sheet: Developing a Gantt Chart*)

Other things to consider:

Interdependencies

Where there are programs of projects, or large and/or complex projects, possibly divided into sub-projects, it is important to define the interdependency management processes to be applied. In other words, how will critically related activities be monitored and managed.

For further exploration of this issue, see the *Tasmanian Government Project Management Guidelines: Section 9.0 Project/Program Integration*.

Critical Path

In estimating timeframes the **Critical Path Method (CPM)** is often used. The **Critical Path** is the chain of activities that links 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. Project Managers, who need to shorten the duration of their project, work on the critical path tasks and add resources and change predecessor relationships to shorten their critical path tasks.

(Refer to the *Project Management Fact Sheets: Project Estimation Developing a Milestone History Monitor*)

Where to get additional help

- Refer to the *Tasmanian Government Project Management Guidelines*.
- The Inter Agency Policy and Projects Unit offers further advice and assistance, including a formal Advisory and Review Service.
- Contact Project Services at project.management@dpac.tas.gov.au
- 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.