Product Breakdown Structure Toolkit

1. Overview

If your are familiar with PRINCE2 pre-2009[1], you'll know that it recommended the use of a number of techniques, one of which is Product Based Planning. A Product Breakdown Structure (PBS) is an essential part of this, its purpose being to define the products (deliverables) of a project and how they relate to each other.

Product Based Planning has four components:

- **Product Description**: a description of the overall project deliverables. In practice the Business case should describe what the project is to deliver, so MMU does not require a formal Product Description separately from the Business case.

- **PBS**, which is the subject of this toolkit.

- **Product Descriptions**: detailed descriptions of each product (deliverable) that goes to make up the final product. In practice a large project may have hundreds of products and it is felt that the creation and maintenance of individual Product Descriptions may be unnecessary. Each project manager should decide whether this is an appropriate part of their project documentation. A **Product Description template** is available if required.

- **Product Flow diagram**: this shows the sequence that the products will be delivered. This is covered in a separate **Activity Network** toolkit.

2. Why have a PBS?

PRINCE2 describes a PBS as "a hierarchical structure that breaks down a final product into its constituent sub-products. It helps the planner to think of what other products are needed to build the final product, and to clarify all necessary work for the creation of that final product."[2]

Another similar technique used by project managers is to create a **Work Breakdown Structure** (WBS). A WBS is the same idea, but instead of identifying the products, you identify the work. PBS seems a more logical approach as the aim of a project is to create the products, and the work is a by-product of that. So PBS focuses on products first – the work identification comes later.

Thus the reason for creating a PBS is to help identify all the products you have to create within the project in order to deliver the overall product, and to link them in logical groups.

3. Creating a PBS

PRINCE2 defines different types of product and suggests creating PBS charts for each type – for example it differentiates between **management products** (e.g. the Business case, the project plan, the risk log) and **specialist products** (the things that the project is there to produce, e.g. the new IT system, the new building).

At MMU the focus is on the latter – it is not felt to be necessary to build a PBS for management products as the project management framework defines what documentation should be used for different types of project.

Specialist products comprise the top level products that make up the final product, plus all the sub-products that go into creating those top level products. If a top level product doesn't need to be broken down into sub-products, it's called a **simple product**. The ones that can be broken down are called **intermediate products**. The following diagram for a "project" to make a cup of tea illustrates the idea.

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[1] The newest version on PRINCE2, released in 2009, no longer includes specific techniques as part of the methodology, though it still states that an appropriate set of techniques is a requirement for project management.
[2] OGC (2005) *Managing Successful Projects with PRINCE2*, TSO, London, p293
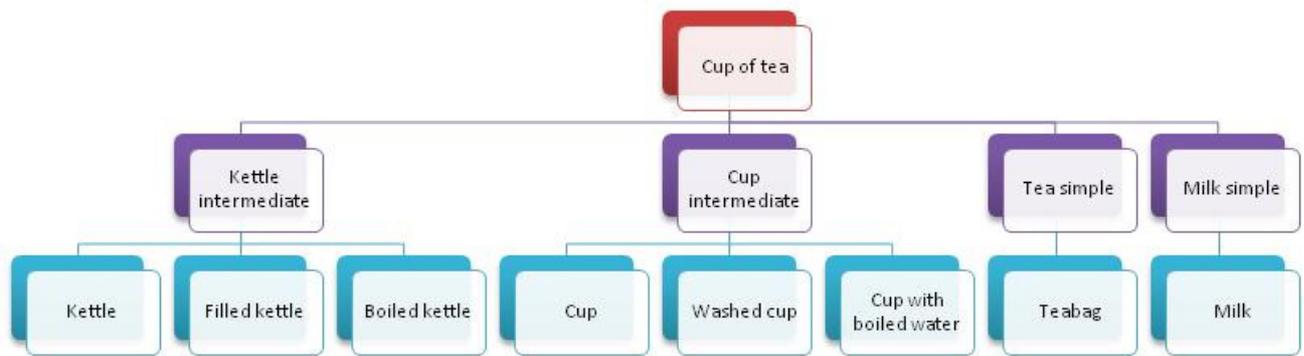
The diagram shows that a cup of tea is made up of four products: the kettle intermediate group, the cup intermediate group, the tea simple product and the milk simple product. The kettle and cup each have three sub-products.

Note that the PBS does not show sequence, though for something as simple as this example parts of the sequence can be implied, e.g. you get the kettle, fill it with water and bring the water to the boil. Similarly you get the cup, wash it and then put the boiled water into it. But the diagram doesn't show whether you get the cup after boiling the water or before.

So once you have completed the PBS the next job is to put it into sequence order (see **Activity Network toolkit**).

Note that the second tier of the diagram does not represent actual products – these are there as labels for the groups of sub-products that go together. They could be omitted from the diagram, but it's helpful to have them there, and also when you create the project plan, they become the names of the project activity headings.

4. How to identify the products

In all but the simplest of projects, no one person will be able to identify all of the products. The best way to identify the products is to hold a workshop with relevant people from across the project – not only will this help tease out the products, but it will help build a common understanding of what the project is to deliver, and joint ownership of that.

It's best to try and identify some of the main top level product groups before the workshop, but not essential.

The workshop should comprise a series of steps:

- People think about products and write each product on a sticky note;

- All the sticky notes are put on a wall;

- Review the sticky notes and remove duplicates;

- Review the remaining sticky notes and put them in related groups;

- Repeat the steps as necessary until everyone feels that all the products have been identified, (usually three or four iterations is enough).

At the first run-through people will be a little uncertain, so allocate a reasonably short period of time for the first step – once a few sticky notes are up on the wall and they can see how things get grouped, they'll cotton on and become more productive.

A more complex (but still quite simple) project example is shown below for moving and renovating a garden shed.
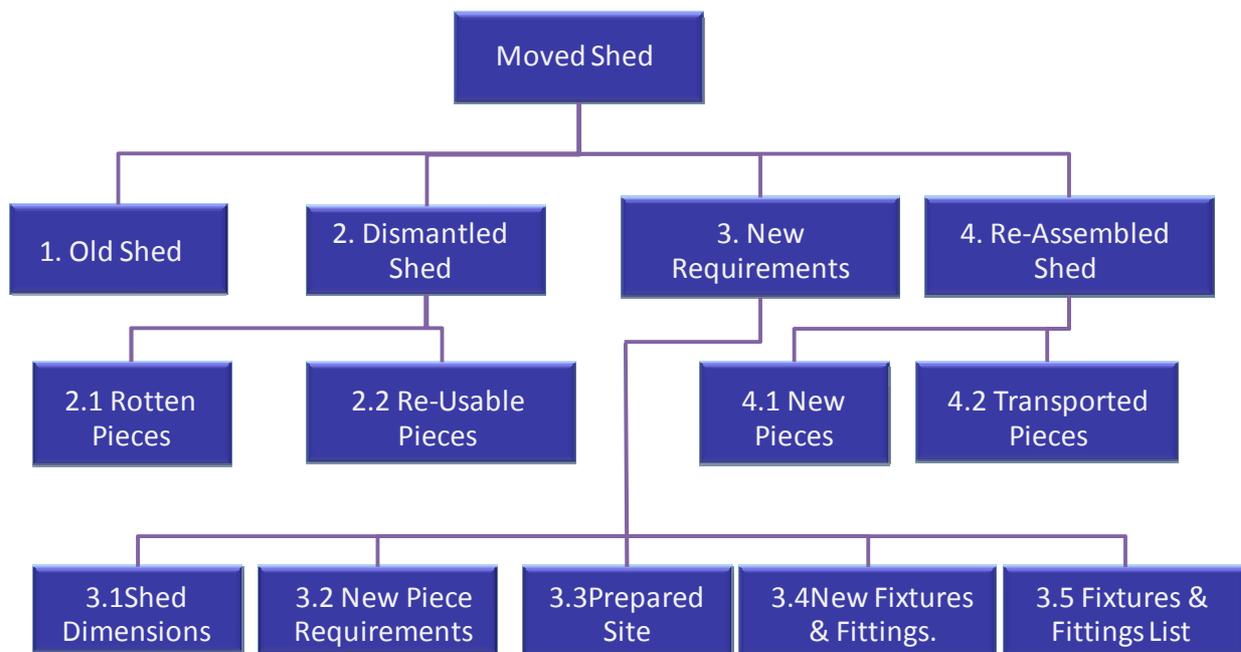
In practice there will be too many products to show on a single PBS diagram, so the master diagram would show the main groups, and a series of supplementary diagrams would show the breakdown for each group. For example item 3 in the above example could occupy a separate diagram with further breakdown of 3.1 (3.1.1 Floor dimensions, 3.1.2 Longest wall dimensions, 3.1.3 Shortest wall dimensions), etc.

Note that the products have been numbered as well as labelled in the shed diagram. This is not obligatory, but it is useful because it helps identify products that belong on a group and also their level in the hierarchy.

Once the PBS has been completed, a final check should be made with the project stakeholders, that everything has been captured. For example the item "3.4 New Fixtures & Fittings" might have a further breakdown that identifies two windows and a door and the sponsor may say that a third window is required. Although such requirements should have been written into the project's mandate, business case and initiation document, in practice these documents are too high level so the PBS is a good tool for teasing out more details in the user specification.

5. Product descriptions

Product descriptions are not mandated for MMU projects, but they can be useful as part of product-based planning for the following reasons:

- They establish the criteria for user acceptance;
- They act as a checklist for project deliverables;
- They clarify what each product is required to deliver.

In small and medium projects, product descriptions possibly are not required – or could perhaps be used for top level products in the PBS. In Major projects it is worth considering whether at least some, if not all, of the products should have product descriptions.

Once the PBS has been completed, as described in section 4, the product descriptions can be written. These should be checked with relevant stakeholders and ideally signed off by the sponsor or project board.

A **product description template** is available, and can be refined as appropriate.