So, for example, say you're starting with the database component of the software (makes sense; good choice). This item is called PB675.1 in the WBS. Your SQL Server 1 and SQL Server 2, at the next level of deliverables, are identified as PB675.1.1 and PB675.1.2, respectively.

This code of accounts allows you to tie time and cost estimates to each deliverable, and provides clear communications when stakeholders ask questions about project deliverables. You can link the code of accounts back to your organization's profit and loss statements.

Finally, you can dump all the elements of the WBS into a WBS Dictionary, which you also create. The WBS Dictionary defines the code of accounts, the time and cost estimates, the characteristics of the deliverables, risk assessment, and other attributes. It's a crib sheet for anyone who needs an at-a-glance look at the WBS.


## Case study: Building a WBS

Happy Yarns is a manufacturer of yarn, ribbons, and other materials. Its project manager, Sarah Montgomery, managed a software project to create a Web-based application that enables customers to place and track orders. This case study follows Sarah through the process of creating the WBS for her project.

You can assume that Sarah already has the inputs to the WBS, such as the project scope statement and scope management plan (to ensure she and her team understand the project deliverables); organizational assets such as policies, procedures, guidelines, and historical data from other projects; and approved change requests (to ensure that she and her team understand any previously approved changes to the project scope).

The first step Sarah took was to convene a WBS meeting with her project team. Her project team consisted of individuals from sales, marketing, IT, and manufacturing.

Sarah explained to her team that the purpose of the meeting was to create an initial work breakdown structure to represent all of the deliverables the project scope promised. Her goal in the meeting was to determine the major categories of deliverables within the project.

Her team determined this project had six major categories of deliverables:

- Web deliverables
- Database deliverables
- E-commerce deliverables
- Marketing deliverables
- Manufacturing deliverables
- Project management deliverables

These six categories captured all of the things that Sarah and her project team would create. Notice that one of the categories included is project management deliverables; this is important because it required Sarah to create documents, estimates, and communications to inform future project managers and enable them to do their work better. The project management deliverables were intended as future historical information.

When creating her WBS, Sarah wanted to use a numbering system called the Code of

Accounts to identify each element within the WBS. Sarah dubbed her project WEBSALES 101 and created a numbering system that followed the schema of W101.

Sarah had Brian Walker, a project team member, plot out six sticky notes across the wall. Each note reflected one of the major deliverables with the numbering schema. Next Sarah and her team began to decompose the major deliverables into smaller components. As the team formed consensus on each deliverable, Brian arranged another sticky note under the appropriate category. Here's what their WBS components looked like at this point:

```
W101.1: Web deliverables
   W101.1.1: User interface
   W101.1.2: Online product
   catalog
   W101.1.3: Java programs
   W101.1.4: Web menus
   W101.1.5: Forms
W101.2: Database deliverables
   W101.2.1: SQL Servers
   W101.2.2: Product
   databases
   W101.2.3: Manufacturing
   databases
   W101.2.4: Security
   measures
W101.3: E-commerce
   deliverables
   W101.3.1: Shopping carts
   W101.3.2: Merchant
   accounts
   W101.3.3: Security
   measures
W101.4: Marketing
   deliverables
   W101.4.1: Verbiage for Web
   content
   W101.4.2: Photos and
   graphics for online
   catalog
   W101.4.3: Promotion
   schedule
W101.5: Manufacturing
   deliverables
   W101.5.1: Schedule of
   material creation
   W101.5.2: Historical
   information of past
   production output
   W101.5.3: Profit margin
   for materials
W101.6: Project management
   deliverables
   W101.6.1: Project
   management plans
   W101.6.2: Project
   calendars
   W101.6.3: Contracts
   W101.6.4: Lessons learned
   documentation
```

With the WBS beginning to take form, Sarah and the team decomposed the deliverables again. Sarah's project team followed the 8/80 Rule: The smallest item in the WBS should equate to no less than 8 hours of labor and no more than 80 hours of labor to create. Through rounds of decomposition, the project team was able to create a robust WBS that depicted all of the project deliverables.

After the WBS was created with the project team, Sarah moved the WBS from sticky notes into her project management information system (PMIS). Sarah continued the development of the WBS to include a WBS Dictionary so she and the project team could reference details on each of the project deliverables and time and cost estimates.