

- **Resources** For example, employees or consultants, junior or senior engineers
- **Tools and equipment** Such as power tools or hand-held tools, newer versus older machinery
- **Types of materials** For example, oak versus plywood
- **Make-or-buy decisions** For instance, build your own software or buy a solution from a vendor



EXAM TIP *Alternative analysis* is used throughout the PMBOK, so you'll likely see this term on the PMP exam. Whenever you have two feasible choices for a component in your project, you're working with alternative analysis.

Relying on Published Estimating Data

If you are a project manager in construction, the cost of the labor you use, the materials you routinely work with, and seasonal factors you consider for each project typically vary, depending on what part of the country, or even the world, your project is operating within. Many companies provide estimating data on the resources your project can purchase based on the geographical locales the project takes place in, supply and demand, and the season of your purchases. Published estimating data helps the project management team determine an exact cost of the resources the project will utilize.

Using Bottom-Up Estimating

Every time I mention bottom-up estimating in one of my seminars, someone snickers and pantomimes drinking a shot of booze. Ha-ha.

Bottom-up estimating is the most accurate time-and-cost estimating approach a project manager can use. This estimating approach starts at "the bottom" of the project and considers every activity, its predecessor and successor activities, and the exact amount of resources needed to complete each activity. Bottom-up estimating accounts for all of the resources needed to complete all of the project work. While it is the most accurate estimating approach, it is also the most time-consuming.



EXAM TIP You'll see bottom-up estimating again in Chapter 7, which examines cost estimating. To complete bottom-up estimating, especially for costs, a WBS must be present. Bottom-up estimating for costs is also known as creating the definitive estimate.

Examining the Activity Resource Estimates

So what do you get when the project manager, the project team, and all your experts complete the activity resource process? You get the requirements for all the project resources. Not a trick question! The process allows the project manager, the project team,