

CS 2

**TABLE 4.1**  
**Cost and Exposure Data**  
**for the Super Grain**  
**Corp. Advertising-Mix**  
**Problem**

Cost Category	Costs		
	Each TV Commercial	Each Magazine Ad	Each Sunday Ad
Ad budget	\$300,000	\$150,000	\$100,000
Planning budget	90,000	30,000	40,000
Expected number of exposures	1,300,000	600,000	500,000

the fee to Giacomi & Jackowitz). Another restriction is that there are only five commercial spots available for running different commercials (one commercial per spot) on children's television programs Saturday morning (medium 1) during the time of the promotional campaign. (The other two media have an ample number of spots available.)

Consequently, the three *resources* for this problem are:

Resource 1: Advertising budget (\$4 million).

Resource 2: Planning budget (\$1 million).

Resource 3: TV commercial spots available (5).

Table 4.1 shows how much of the advertising budget and the planning budget would be used by each advertisement in the respective media.

- The first row gives the cost per advertisement in each medium.
- The second row shows Giacomi & Jackowitz's estimates of its total cost (including overhead and profit) for designing and developing each advertisement for the respective media.<sup>1</sup> (This cost represents the billable fee from Super Grain.)
- The last row then gives the expected number of exposures per advertisement.

### Analysis of the Problem

Claire decides to formulate and solve a linear programming model for this problem on a spreadsheet. The formulation procedure summarized at the end of Section 2.3 guides this process. Like any linear programming model, this model will have four components:

1. The data
2. The decisions
3. The constraints
4. The measure of performance

The spreadsheet needs to be formatted to provide the following kinds of cells for these components:

Data → data cells

Decisions → changing cells

Constraints → output cells

Measure of performance → target cell

Figure 4.1 shows the spreadsheet model formulated by Claire. Let us see how she did this by considering each of the components of the model individually.

<sup>1</sup>When presenting its estimates in this form, the firm is making two simplifying assumptions. One is that its cost for designing and developing each additional advertisement in a medium is roughly the same as for the first advertisement in that medium. The second is that its cost when working with one medium is unaffected by how much work it is doing (if any) with the other media.

Four kinds of cells are needed for these four components of a spreadsheet model.