APPENDIX

Tools for Planning and Decision Making

OUTLINE

- **Forecasting**
  - Sales and Revenue Forecasting
  - Technological Forecasting
  - Other Types of Forecasting
  - Forecasting Techniques
- **Other Planning Techniques**
  - Linear Programming
  - Breakeven Analysis
  - Simulations
  - PERT
- **Decision-Making Tools**
  - Payoff Matrices
  - Decision Trees
  - Other Techniques
- **Strengths and Weaknesses of Planning Tools**
  - Weaknesses and Problems
  - Strengths and Advantages

This appendix discusses a number of the basic tools and techniques that managers can use to enhance the efficiency and effectiveness of planning and decision making. We first describe forecasting, an extremely important tool, and then discuss several other planning techniques. Next we discuss several tools that relate more to decision making. We conclude by assessing the strengths and weaknesses of the various tools and techniques.

■ Forecasting

To plan, managers must make assumptions about future events. But unlike wizards of old, planners cannot simply look into a crystal ball. Instead, they must develop forecasts of probable future circumstances. **Forecasting** is the process of developing assumptions or premises about the future that managers can use in planning or decision making.

forecasting The process of developing assumptions or premises about the future that managers can use in planning or decision making

Sales and Revenue Forecasting

As the term implies, **sales forecasting** is concerned with predicting future sales. Because monetary resources (derived mainly from sales) are necessary to finance both current and future operations, knowledge of future sales is of vital importance. Sales forecasting is something that every business, from Exxon to a neighborhood pizza parlor, must do. Consider, for example, the following questions that a manager might need to answer:

sales forecasting The prediction of future sales

1. How much of each of our products should we produce next week? next month? next year?
2. How much money will we have available to spend on research and development and on new-product test marketing?
3. When and to what degree will we need to expand our existing production facilities?
4. How should we respond to union demands for a 5 percent pay increase?
5. If we borrow money for expansion, when can we pay it back?

None of these questions can be answered adequately without some notion of what future revenues are likely to be. Thus, sales forecasting is generally one of the first steps in planning.

Unfortunately, the term *sales forecasting* suggests that this form of forecasting is appropriate only for organizations that have something to sell. But other kinds of organizations also depend on financial resources, and so they also must forecast. The University of South Carolina, for example, must forecast future state aid before planning course offerings, staff size, and so on. Hospitals must forecast their future income from patient fees, insurance payments, and other sources to assess their ability to expand. Although we will continue to use the conventional term, keep in mind that what is really at issue is **revenue forecasting**.

revenue forecasting The prediction of future revenues from all sources

Several sources of information are used to develop a sales forecast. Previous sales figures and any obvious trends, such as the company's growth or stability, usually serve as the base. General economic indicators, technological improvements, new marketing strategies, and the competition's behavior all may be added together to ensure an accurate forecast. Once projected, the sales (or revenues) forecast becomes a guiding framework for various other activities. Raw-material expenditures, advertising budgets, sales-commission structures, and similar operating costs are all based on projected sales figures.

Organizations often forecast sales across several time horizons. The longer-run forecasts may then be updated and refined as various shorter-run cycles are completed. For obvious reasons, a forecast should be as accurate as possible, and the accuracy of sales forecasting tends to increase as organizations learn from their previous forecasting experience. But the more uncertain and complex future conditions are likely to be, the more difficult it is to develop accurate forecasts. To offset these problems partially, forecasts are more useful to managers if they are expressed as a range rather than as an absolute index or number. If projected sales increases are expected to be in the range of 10 to 12 percent, a manager can consider all the implications for the entire range. A 10 percent increase could dictate one set of activities; a 12 percent increase could call for a different set of activities.

Technological Forecasting

technological forecasting The prediction of what future technologies are likely to emerge and when they are likely to be economically feasible

Technological forecasting is another type of forecasting used by many organizations. It focuses on predicting what future technologies are likely to emerge and when they are likely to be economically feasible. In an era when technological breakthrough and innovation have become the rule rather than the exception, it is important that managers be able to anticipate new developments. If a manager invests heavily in existing technology (such as production processes, equipment, and computer systems) and the technology becomes obsolete in the near future, the company has wasted its resources.

The most striking technological innovations in recent years have been in electronics, especially semiconductors. Home computers, electronic games, and sophisticated communications equipment are all evidence of the electronics explosion. Given the increasing importance of technology and the rapid pace of technological innovation, it follows that managers will grow increasingly concerned with technological forecasting in the years to come.

Other Types of Forecasting

Other types of forecasting are also important to many organizations. Resource forecasting projects the organization's future needs for and the availability of human resources, raw materials, and other resources. General economic conditions are the subject of economic forecasts. For example, some organizations undertake population or market-size forecasting. Some organizations also attempt to forecast future government fiscal policy and various government regulations that might be

put into practice. Indeed, almost any component in an organization's environment may be an appropriate area for forecasting.

Forecasting Techniques

To carry out the various kinds of forecasting we have identified, managers use several different techniques.[1] Time-series analysis and causal modeling are two common quantitative techniques.

Time-Series Analysis The underlying assumption of **time-series analysis** is that the past is a good predictor of the future. This technique is most useful when the manager has a lot of historical data available and when stable trends and patterns are apparent. In a time-series analysis, the variable under consideration (such as sales or enrollment) is plotted across time, and a "best-fit" line is identified.[2] Figure A.1 shows how a time-series analysis might look. The dots represent the number of units sold for each year from 1994 through 2002. The best-fit line has also been drawn in. It is the line around which the dots cluster with the least variability. A manager who wants to know what sales to expect in 2003 simply extends the line. In this case the projection would be around eighty-two hundred units.

time-series analysis A forecasting technique that extends past information into the future through the calculation of a best-fit line

Real time-series analysis involves much more than simply plotting sales data and then using a ruler and a pencil to draw and extend the line. Sophisticated mathematical procedures, among other things, are necessary to account for seasonal and cyclical fluctuations and to identify the true best-fit line. In real situations, data seldom follow the neat pattern found in Figure A.1. Indeed, the data points may be so widely dispersed that they mask meaningful trends from all but painstaking, computer-assisted inspection.

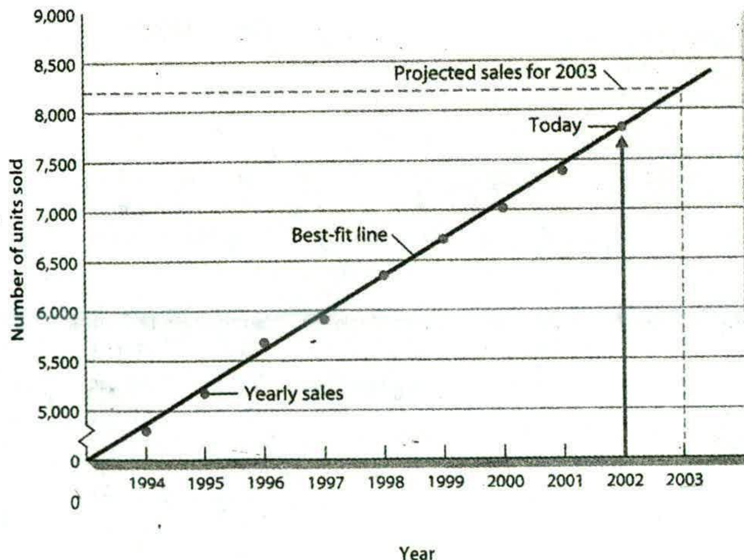


Figure A.1

An Example of Time-Series Analysis

Because time-series analysis assumes that the past is a good predictor of the future, it is most useful when historical data are available, trends are stable, and patterns are apparent. For example, it can be used for projecting estimated sales for products like shampoo, pens, and automobile tires. (Of course, few time-series analyses yield such clear results because there is almost always considerably more fluctuation in data from year to year.)

causal modeling A group of different techniques that determine casual relationships between different variables

regression model An equation that uses one set of variables to predict another variable

Causal Modeling Another useful forecasting technique is **causal modeling**. Actually, the term *causal modeling* represents a group of several techniques. Table A.1 summarizes three of the most useful approaches. **Regression models** are equations created to predict a variable (such as sales volume) that depends on several other variables (such as price and advertising). The variable being predicted is called the *dependent variable*; the variables used to make the prediction are called *independent variables*. A typical regression equation used by a small business might take this form:

$$y = ax_1 + bx_2 + cx_3 + d$$

where

y = the dependent variable (sales in this case)

x_1, x_2, and x_3 = independent variables (advertising budget, price, and commissions)

a, b, and c = weights for the independent variables calculated during development of the regression model

d = a constant

To use the model, a manager can insert various alternatives for advertising budget, price, and commissions into the equation and then compute y. The calculated value of y represents the forecasted level of sales, given various levels of advertising, price, and commissions.[3]

econometric model A causal model that predicts major economic shifts and the potential impact of those shifts on the organization

Econometric models employ regression techniques at a much more complex level. **Econometric models** attempt to predict major economic shifts and the potential impact of those shifts on the organization. They might be used to predict various age, ethnic, and economic groups that will characterize different regions of the United States in the year 2010 and also to predict the kinds of products and services these groups may want. A complete econometric model may consist of hundreds or even thousands of equations. Computers are almost always necessary to apply them. Given the complexities involved in developing econometric mod-

Table A.1

Summary of Causal Modeling Forecasting Techniques

Managers use several different types of causal models in planning and decision making. Three popular models are regression models, econometric models, and economic indicators.

Regression models	Used to predict one variable (called the dependent variable) on the basis of known or assumed other variables (called independent variables). For example, we might predict future sales based on the values of price, advertising, and economic levels.
Econometric models	Make use of several multiple-regression equations to consider the impact of major economic shifts. For example, we might want to predict what impact the migration toward the Sun Belt might have on our organization.
Economic indicators	Various population statistics, indexes, or parameters that predict organizationally relevant variables such as discretionary income. Examples include cost-of-living index, inflation rate, and level of unemployment.

els, many firms that decide to use them rely on outside consultants specializing in this approach.

Economic indicators, another form of causal model, are population statistics or indexes that reflect the economic well-being of a population. Examples of widely used economic indicators include the current rates of national productivity, inflation, and unemployment. In using such indicators, the manager draws on past experiences that have revealed a relationship between a certain indicator and some facet of the company's operations. Pitney Bowes Data Documents Division, for example, can predict future sales of its business forms largely on the basis of current GNP estimates and other economic growth indexes.

economic indicator A key population statistic or index that reflects the economic well-being of a population

Qualitative Forecasting Techniques Organizations also use several qualitative techniques to develop their forecasts. A **qualitative forecasting technique** relies more on individual or group judgment or opinion rather than on sophisticated mathematical analyses. The Delphi procedure, described in Chapter 9 as a mechanism for managing group decision-making activities, can also be used to develop forecasts. A variation of it—the *jury-of-expert-opinion* approach—involves using the basic Delphi process with members of top management. In this instance, top management serves as a collection of experts asked to make a prediction about something—competitive behavior, trends in product demand, and so forth. Either a pure Delphi or a jury-of-expert-opinion approach might be useful in technological forecasting.

qualitative forecasting technique One of several techniques that rely on individual or group judgment rather than on mathematical analyses

The *sales-force-composition* method of sales forecasting is a pooling of the predictions and opinions of experienced salespeople. Because of their experience, these individuals are often able to forecast quite accurately what various customers will do. Management combines these forecasts and interprets the data to create plans. Textbook publishers use this procedure to project how many copies of a new title they might sell.

The *customer evaluation* technique goes beyond an organization's sales force and collects data from customers of the organization. The customers provide estimates of their own future needs for the goods and services that the organization supplies. Managers must combine, interpret, and act on this information. This approach, however, has two major limitations. Customers may be less interested in taking time to develop accurate predictions than are members of the organization itself, and the method makes no provision for including any new customers that the organization may acquire. Wal-Mart helps its suppliers use this approach by providing them with detailed projections regarding what it intends to buy several months in advance.

Selecting an appropriate forecasting technique can be as important as applying it correctly. Some techniques are appropriate only for specific circumstances. For example, the sales-force-composition technique is good only for sales forecasting. Other techniques, like the Delphi method, are useful in a variety of situations. Some techniques, such as the econometric models, require extensive use of computers, whereas others, such as customer evaluation models, can be used with little mathematical expertise. For the most part, selection of a particular technique depends on the nature of the problem, the experience and preferences of the manager, and available resources.[4]

■ Other Planning Tecniques

Of course, planning involves more than just forecasting. Other tools and techniques that are useful for planning purposes include linear programming, breakeven analysis, and simulations.

Linear Programming

linear programming A planning technique that determines the optimal combination of resources and activities

Linear programming is one of the most widely used quantitative tools for planning. **Linear programming** is a procedure for calculating the optimal combination of resources and activities. It is appropriate when there is some objective to be met (such as a sales quota or a certain production level) within a set of constraints (such as a limited advertising budget or limited production capabilities).

To illustrate how linear programming can be used, assume that a small electronics company produces two basic products—a high-quality cable television tuner and a high-quality receiver for picking up television audio and playing it through a stereo amplifier. Both products go through the same two departments, first production and then inspection and testing. Each product has a known profit margin and a high level of demand. The production manager's job is to produce the optimal combination of tuners (T) and receivers (R) that maximizes profits and uses the time in production (PR) and in inspection and testing (IT) most efficiently. Table A.2 gives the information needed for the use of linear programming to solve this problem.

The *objective function* is an equation that represents what we want to achieve. In technical terms, it is a mathematical representation of the desirability of the consequences of a particular decision. In our example, the objective function can be represented as follows:

$$\text{Maximize profit} = \$30X_T + \$20X_R$$

where

R = the number of receivers to be produced

T = the number of tuners to be produced

The \$30 and \$20 figures are the respective profit margins of the tuner and receiver, as noted in Table A.2. The objective, then, is to maximize profits.

However, this objective must be accomplished within a specific set of constraints. In our example, the constraints are the time required to produce each product in each department and the total amount of time available. These data are also found in Table A.2 and can be used to construct the relevant constraint equations:

$$10T + 6R \leq 150$$

$$4T + 4R \leq 80$$

(that is, we cannot use more capacity than is available), and of course,

$$T \geq 0$$

$$R \geq 0$$

Table A.2

Production Data for Tuners and Receivers

Linear programming can be used to determine the optimal number of tuners and receivers an organization might make. Essential information needed to perform this analysis includes the number of hours each product spends in each department, the production capacity for each department, and the profit margin for each product.

Department	Number of Hours Required per Unit		Production Capacity for Day (in Hours)
	Tuners (*T*)	Receivers (*R*)	
Production (PR)	10	6	150
Inspection and testing (IT)	4	4	80
Profit margin	$30	$20	

The set of equations consisting of the objective function and constraints can be solved graphically. To start, we assume that production of each product is maximized when production of the other is at zero. The resultant solutions are then plotted on a coordinate axis. In the PR department, if $T = 0$ then:

$$10T + 6R \leq 150$$

$$10(0) + 6R \leq 150$$

$$R \leq 25$$

In the same department, if $R = 0$ then:

$$10T + 6(R) \leq 150$$

$$10T + 6(0) \leq 150$$

$$T \leq 15$$

Similarly, in the IT department, if no tuners are produced,

$$4T + 4R \leq 80$$

$$4(0) + 4R \leq 80$$

$$R \leq 20$$

and, if no receivers are produced,

$$4T + 4R \leq 80$$

$$4T + 4(0) \leq 80$$

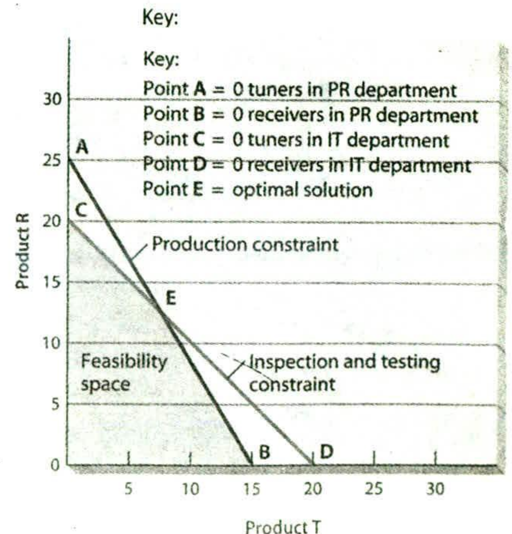
$$T \leq 20$$

The four resulting inequalities are graphed in Figure A.2. The shaded region represents the feasibility space, or production combinations that do not exceed the capacity of either department. The optimal number of products will be defined at one of the four

Figure A.2

The Graphical Solution of a Linear Programming Problem

Finding the graphical solution to a linear programming problem is useful when only two alternatives are being considered. When problems are more complex, computers that can execute hundreds of equations and variables are necessary. Virtually all large firms, such as General Motors, Texaco, and Sears, use linear programming.



corners of the shaded area—that is, the firm should produce twenty receivers only (point C), fifteen tuners only (point B), thirteen receivers and seven tuners (point E), or no products at all. With the constraint that production of both tuners and receivers must be greater than zero, it follows that point E is the optimal solution. That combination requires 148 hours in PR and 80 hours in IT and yields $470 in profit. (Note that if only receivers were produced, the profit would be $400; producing only tuners would mean $450 in profit.)

Unfortunately, only two alternatives can be handled by the graphical method, and our example was extremely simple. When there are other alternatives, a complex algebraic method must be employed. Real-world problems may require several hundred equations and variables. Clearly, computers are necessary to execute such sophisticated analyses. Linear programming is a powerful technique, playing a key role in both planning and decision making. It can be used to schedule production, select an optimal portfolio of investments, allocate sales representatives to territories, or produce an item at some minimum cost.

Breakeven Analysis

Linear programming is called a *normative procedure* because it prescribes the optimal solution to a problem. Breakeven analysis is a *descriptive procedure* because it simply describes relationships among variables; then it is up to the manager to make decisions. We can define **breakeven analysis** as a procedure for identifying the point at which revenues start covering their associated costs. It might be used to analyze the effects on profits of different price and output combinations or various levels of output.

breakeven analysis A procedure for identifying the point at which revenues start covering their associated costs

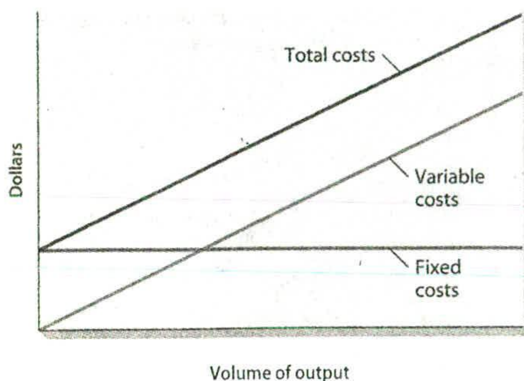
Figure A.3 represents the key cost variables in breakeven analysis. Creating most products or services includes three types of costs: fixed costs, variable costs, and total costs. *Fixed costs* are costs that are incurred regardless of what volume of output is being generated. They include rent or mortgage payments on the building, managerial salaries, and depreciation of plant and equipment. *Variable costs* vary with the number of units produced, such as the cost of raw materials and direct labor used to make each unit. *Total costs* are fixed costs plus variable costs. Note that because of fixed costs, the line for total costs never begins at zero.

Other important factors in breakeven analysis are revenue and profit. *Revenue*, the total dollar amount of sales, is computed by multiplying the number of units sold by the sales price of each unit. *Profit* is then determined by subtracting total costs from total revenues. When revenues and total costs are plotted on the same axes, the breakeven graph shown in Figure A.4 emerges. The point at which the lines representing total costs and total revenues cross is the breakeven point. If the company represented in Figure A.4

Figure A.3

An Example of Cost Factors for Breakeven Analysis

To determine the breakeven point for profit on sales for a product or service, the manager must first determine both fixed and variable costs. These costs are then combined to show total costs.



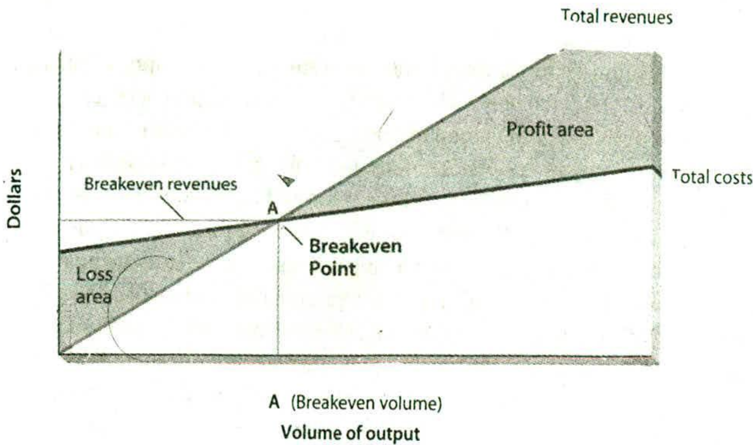


Figure A.4

Breakeven Analysis

After total costs are determined and graphed, the manager then graphs the total revenues that will be earned on different levels of sales. The regions defined by the intersection of the two graphs show loss and profit areas. The intersection itself shows the breakeven point—the level of sales at which all costs are covered but no profits are earned.

sells more units than are represented by point A, it will realize a profit; selling below that level will result in a loss.

Mathematically, the breakeven point (expressed as units of production or volume) is shown by the formula

$$BP = \frac{TFC}{P - VC}$$

where

BP = breakeven point

TFC = total fixed costs

P = price per unit

VC = variable cost per unit

Assume that you are considering the production of a new garden hoe with a curved handle. You have determined that an acceptable selling price will be \$20. You have also determined that the variable costs per hoe will be \$15, and you have total fixed costs of \$400,000 per year. The question is, How many hoes must you sell each year to break even? Using the breakeven model, you find that

$$BP = \frac{TFC}{P - VC}$$

$$BP = \frac{400{,}000}{20 - 15}$$

$$BP = 80{,}000 \text{ units}$$

Thus, you must sell eighty thousand hoes to break even. Further analysis would also show that if you could raise your price to \$25 per hoe, you would need to sell only forty thousand to break even, and so on.

The state of New York used a breakeven analysis to evaluate seven variations of prior approvals for its Medicaid service. Comparisons were conducted of the costs involved in each variation against savings gained from efficiency and improved quality of service. The state found that only three of the variations were cost effective.[5]

Breakeven analysis is a popular and important planning technique, but it also has noteworthy weaknesses. It considers revenues only up to the breakeven point, and it makes no allowance for the time value of money. For example, because the funds used to cover fixed and variable costs could be used for other purposes (such as investment), the organization is losing interest income by tying up its money prior to reaching the breakeven point. Thus, managers often used breakeven analysis as only the first step in planning. After the preliminary analysis has been completed, more sophisticated techniques (such as rate-of-return analysis or discounted-present-value analysis) are used. Those techniques can help the manager decide whether to proceed or to divert resources into other areas.

Simulations

organizational simulation A model of a real-world situation that can be manipulated to discover how it functions

Another useful planning device is simulation. The word *simulate* means to copy or to represent. An **organizational simulation** is a model of a real-world situation that can be manipulated to discover how it functions. Simulation is a descriptive, rather than a prescriptive, technique. Northern Research & Engineering Corporation is an engineering consulting firm that helps clients plan new factories. By using a sophisticated factory simulation model, the firm recently helped a client cut several machines and operations from a new plant and to save over $750,000.

To consider another example, suppose the city of Houston was going to build a new airport. Issues to be addressed might include the number of runways, the direction of those runways, the number of terminals and gates, the allocation of various carriers among the terminals and gates, and the technology and human resources needed to achieve a target frequency of takeoffs and landings. (Of course, actually planning such an airport would involve many more variables than these.) A model could be constructed to simulate these factors, as well as their interrelationships. The planner could then insert several different values for each factor and observe the probable results.

Simulation problems are in some ways similar to those addressed by linear programming, but simulation is more useful in very complex situations characterized by diverse constraints and opportunities. The development of sophisticated simulation models may require the expertise of outside specialists or consultants, and the complexity of simulation almost always necessitates the use of a computer. For these reasons, simulation is most likely to be used as a technique for planning in large organizations that have the required resources.

PERT

PERT A planning tool that uses a network to plan projects involving numerous activities and their interrelationships

A final planning tool that we will discuss is PERT. **PERT**, an acronym for Program Evaluation and Review Technique, was developed by the U.S. Navy to help coordinate the activities of three thousand contractors during the development of the

Polaris nuclear submarine, and it was credited with saving two years of work on the project. It has subsequently been used by most large companies in different ways. The purpose of PERT is to develop a network of activities and their interrelationships and thus highlight critical time intervals that affect the overall project. PERT follows six basic steps:

1. Identify the activities to be performed and the events that will mark their completion.
2. Develop a network showing the relationships among the activities and events.
3. Calculate the time needed for each event and the time necessary to get from each event to the next.
4. Identify within the network the longest path that leads to completion of the project. This path is called the critical path.
5. Refine the network.
6. Use the network to control the project.

Suppose that a marketing manager wants to use PERT to plan the test marketing and nationwide introduction of a new product. Table A.3 identifies the basic steps involved in carrying out this project. The activities are then arranged in a network like the one shown in Figure A.5. In the figure, each completed event is represented by a number in a circle. The activities are indicated by letters on the lines connecting the events. Notice that some activities are performed independently of one another and that others must be performed in sequence. For example, test production (activity a) and test site location (activity c) can be done at the same time, but test site location has to be done before actual testing (activities f and g) can be done.

Table A.3

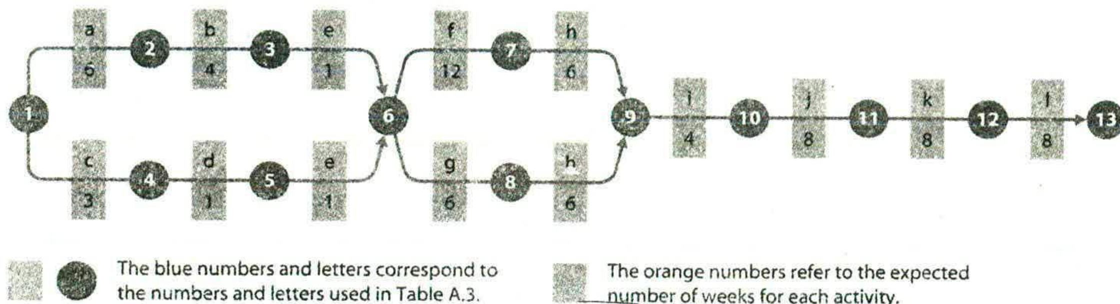
Activities and Events for Introducing a New Product

PERT is used to plan schedules for projects, and it is particularly useful when many activities with critical time intervals must be coordinated. Besides launching a new product, PERT is useful for projects like constructing a new factory or building, remodeling an office, or opening a new store.

Activities		Events	
		1	Origin of project.
a	Produce limited quantity for test marketing.	2	Completion of production for test marketing.
b	Design preliminary package.	3	Completion of design for preliminary package.
c	Locate test market.	4	Test market located.
d	Obtain local merchant cooperation.	5	Local merchant cooperation obtained.
e	Ship product to selected retail outlets.	6	Product for test marketing shipped to retail outlets.
f	Monitor sales and customer reactions.	7	Sales and customer reactions monitored.
g	Survey customers in test-market area.	8	Customers in test-market area surveyed.
h	Make needed product changes.	9	Product changes made.
i	Make needed package changes.	10	Package changes made.
j	Mass-produce the product.	11	Product mass-produced.
k	Begin national advertising.	12	National advertising carried out.
l	Begin national distribution.	13	National distribution completed.

Figure A.5

A PERT Network for Introducing a New Product



The time needed to get from one activity to another is then determined. The normal way to calculate the time between each activity is to average the most optimistic, most pessimistic, and most likely times, with the most likely time weighted by 4. Time is usually calculated with the following formula:

$$\text{Expected time} = \frac{a + 4b + c}{6}$$

where

a = optimistic time

b = most likely time

c = pessimistic time

critical path The longest path through a PERT network

The expected number of weeks for each activity in our example is shown in parentheses along each path in Figure A.5. The **critical path**—or the longest path through the PERT network—is then identified. This path is considered critical because it shows the shortest time in which the project can be completed. In our example, the critical path is 1-2-3-6-7-9-10-11-12-13, totaling fifty-seven weeks. PERT thus tells the manager that the project will take fifty-seven weeks to complete.

The first network may be refined. If fifty-seven weeks to completion is too long a time, the manager might decide to begin preliminary package design before the test products are finished. Or the manager might decide that ten weeks rather than twelve is a sufficient time period to monitor sales. The idea is that if the critical path can be shortened, so too can the overall duration of the project. The PERT network serves as an ongoing framework for both planning and control throughout the project. For example, the manager can use it to monitor where the project is relative to where it needs to be. Thus, if an activity on the critical path takes longer than planned, the manager needs to make up the time elsewhere or live with the fact that the entire project will be late.

Decision-Making Tools

Managers can also use a number of tools that relate more specifically to decision making than to planning. Two commonly used decision-making tools are payoff matrices and decision trees.

Payoff Matrices

A **payoff matrix** specifies the probable value of different alternatives, depending on different possible outcomes associated with each. The use of a payoff matrix requires that several alternatives be available, that several different events could occur, and that the consequences depend on which alternative is selected and on which event or set of events occurs. An important concept in understanding the payoff matrix, then, is probability. A **probability** is the likelihood, expressed as a percentage, that a particular event will or will not occur. If we believe that a particular event will occur seventy-five times out of one hundred, we can say that the probability of its occurring is 75 percent, or .75. Probabilities range in value from 0 (no chance of occurrence) to 1.00 (certain occurrence—also referred to as 100 percent). In the business world, there are few probabilities of either 0 or 1.00. Most probabilities that managers use are based on subjective judgment, intuition, and historical data.

payoff matrix A decision-making tool that specifies the probable value of different alternatives, depending on different possible outcomes associated with each

probability The likelihood, expressed as a percentage, that a particular event will or will not occur

The **expected value** of an alternative course of action is the sum of all possible values of outcomes from that action multiplied by their respective probabilities. Suppose, for example, that a venture capitalist is considering investing in a new company. If he believes there is a .40 probability of making $100,000, a .30 probability of making $30,000, and a .30 probability of losing $20,000, the expected value (EV) of this alternative is

expected value When applied to alternative courses of action, the sum of all possible values of outcomes from that action multiplied by their respective probabilities

$$EV = .40(100{,}000) + .30(30{,}000) + .30(-20{,}000)$$

$$EV = 40{,}000 + 9{,}000 - 6{,}000$$

$$EV = \$43{,}000$$

The investor can then weigh the expected value of this investment against the expected values of other available alternatives. The highest EV signals the investment that should most likely be selected.

For example, suppose another venture capitalist wants to invest $20,000 in a new business. She has identified three possible alternatives: a leisure products company, an energy enhancement company, and a food-producing company. Because the expected value of each alternative depends on short-run changes in the economy, especially inflation, she decides to develop a payoff matrix. She estimates that the probability of high inflation is .30 and the probability of low inflation is .70. She then estimates the probable returns for each investment in the event of both high and low inflation. Figure A.6 shows what the payoff matrix

Figure A.6

An Example of a Payoff Matrix

A payoff matrix helps the manager determine the expected value of different alternatives. A payoff matrix is effective only if the manager ensures that probability estimates are as accurate as possible.

		High inflation (*probability of .30*)	Low inflation (*probability of .70*)
Investment alternative 1	Leisure products company	-$10,000	+$50,000
Investment alternative 2	Energy enhancement company	+$90,000	-$15,000
Investment alternative 3	Food-processing company	+$30,000	+$25,000

might look like (a minus sign indicates a loss). The expected value of investing in the leisure products company is

$$EV = .30(-10{,}000) + .70(50{,}000)$$

$$EV = -3{,}000 + 35{,}000$$

$$EV = \$32{,}000$$

Similarly, the expected value of investing in the energy enhancement company is

$$EV = .30(90{,}000) + .70(-15{,}000)$$

$$EV = 27{,}000 + (-10{,}500)$$

$$EV = \$16{,}500$$

And, finally, the expected value of investing in the food-processing company is

$$EV = .30(30{,}000) + .70(25{,}000)$$

$$EV = 9{,}000 + 17{,}500$$

$$EV = \$26{,}500$$

Investing in the leisure products company, then, has the highest expected value.

Other potential uses for payoff matrices include determining optimal order quantities, deciding whether to repair or replace broken machinery, and deciding which of several new products to introduce. Of course, the real key to using payoff matrices effectively is making accurate estimates of the relevant probabilities.

Decision Trees

decision tree A planning tool that extends the concept of a payoff matrix through a sequence of decisions

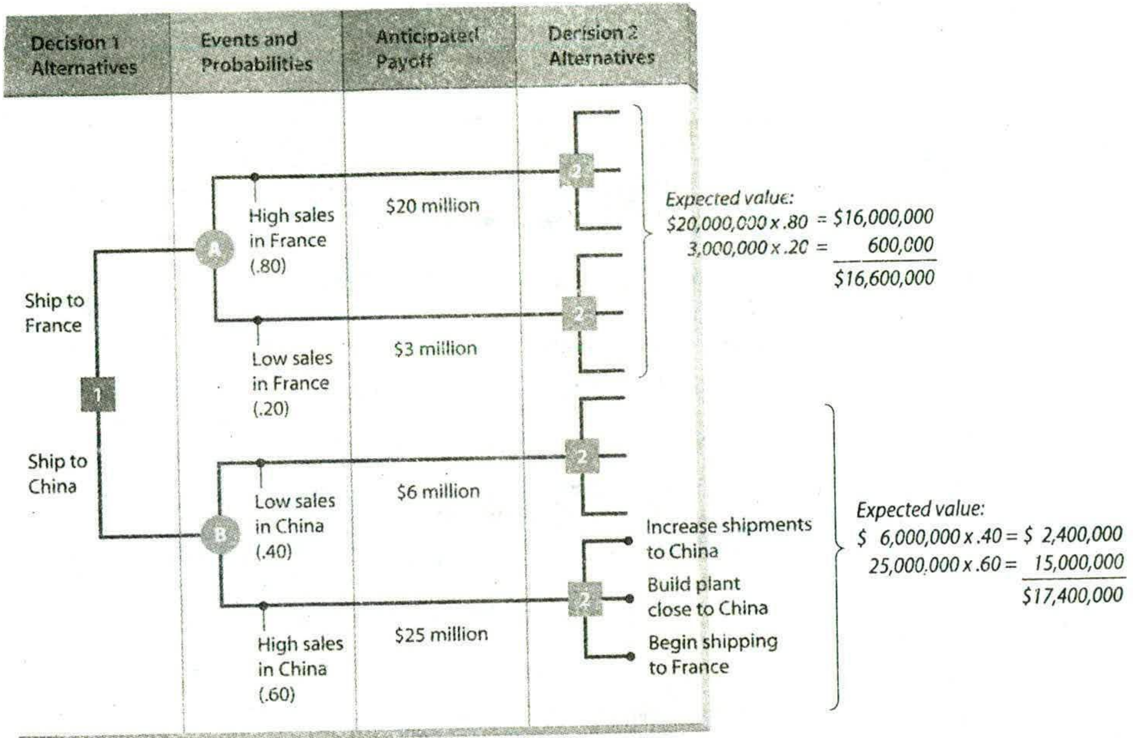
Decision trees are like payoff matrices because they enhance a manager's ability to evaluate alternatives by making use of expected values. However, they are most appropriate when there are several decisions to be made in sequence.

Figure A.7 illustrates a hypothetical decision tree. The small firm represented wants to begin exporting its products to a foreign market, but limited capacity re-

Figure A.7

An Example of a Decision Tree

A decision tree extends the basic concepts of a payoff matrix through multiple decisions. This tree shows the possible outcomes of two levels of decisions. The first decision is whether to expand to China or to France. The second decision, assuming that the company expands to China, is whether to increase shipments to China, build a plant close to China, or initiate shipping to France.



stricts it to only one market at first. Managers feel that either France or China would be the best place to start. Whichever alternative is selected, sales for the product in that country may turn out to be high or low. In France, there is a .80 chance of high sales and a .20 chance of low sales. The anticipated payoffs in these situations are predicted to be $20 million and $3 million, respectively. In China, the probabilities of high versus low sales are .60 and .40, respectively, and the associated payoffs are presumed to be $25 million and $6 million. As shown in Figure A.7, the expected value of shipping to France is $16,600,000, whereas the expected value of shipping to China is $17,400,000.

The astute reader will note that this part of the decision could have been set up as a payoff matrix. However, the value of decision trees is that we can extend the model to include subsequent decisions. Assume, for example, that the company

begins shipping to China. If high sales do in fact materialize, the company will soon reach another decision situation. It might use the extra revenues to (1) increase shipments to China, (2) build a plant close to China and thus cut shipping costs, or (3) begin shipping to France. Various outcomes are possible for each decision, and each outcome will also have both a probability and an anticipated payoff. It is therefore possible to compute expected values back through several tiers of decisions all the way to the initial one. As it is with payoff matrices, determining probabilities accurately is the crucial element in the process. Properly used, however, decision trees can provide managers with a useful road map through complex decision situations.

Other Techniques

In addition to payoff matrices and decision trees, several other quantitative methods are also available to facilitate decision making.

inventory model A technique that helps managers decide how much inventory to maintain

Inventory Models **Inventory models** are techniques that help the manager decide how much inventory to maintain. Target Stores uses inventory models to help determine how much merchandise to order, when to order it, and so forth. Inventory consists of both raw materials (inputs) and finished goods (outputs). Polaroid, for example, maintains a supply of the chemicals that it uses to make film, the cartons it packs film in, and packaged film ready to be shipped. For finished goods, both extremes are bad: excess inventory ties up capital, whereas a small inventory may result in shortages and customer dissatisfaction. The same holds for raw materials: too much inventory ties up capital, but if a company runs out of resources, work stoppages may occur. Finally, because the process of placing an order for raw materials and supplies has associated costs (such as clerical time, shipping expenses, and higher unit costs for small quantities), it is important to minimize the frequency of ordering. Inventory models help the manager make decisions that optimize the size of inventory. New innovations in inventory management such as **just-in-time**, or **JIT**, rely heavily on decision-making models. A JIT system involves scheduling materials to arrive in small batches as they are needed, thereby eliminating the need for a big reserve inventory, warehouse space, and so forth.[6]

just-in-time (JIT) An inventory management technique in which materials are scheduled to arrive in small batches as they are needed, eliminating the need for resources such as big reserves and warehouse space

queuing model A model used to optimize waiting lines in organizations

Queuing Models **Queuing models** are intended to help organizations manage waiting lines. We are all familiar with such situations: shoppers waiting to pay for groceries at Kroger, drivers waiting to buy gas at an Exxon station, travelers calling American Airlines for reservations, and customers waiting for a teller at Citibank. Take the Kroger example. If a store manager has only one check-out stand in operation, the store's cost for check-out personnel is very low; however, many customers are upset by the long line that frequently develops. To solve the problem, the store manager could decide to keep twenty check-out stands open at all times. Customers would like the short waiting period, but personnel costs would be very high. A queuing model would be appropriate in this case to help the manager determine the optimal number of check-out stands: the number that would balance personnel costs and customer waiting time. Target Stores uses queuing models to determine how many check-out lanes to put in its retail stores.

Distribution Models A decision facing many marketing managers relates to the distribution of the organization's products. Specifically, the manager must decide where the products should go and how to transport them. Railroads, trucking, and air freight have associated shipping costs, and each mode of transportation follows different schedules and routes. The problem is to identify the combination of routes that optimize distribution effectiveness and distribution costs. **Distribution models** help managers determine this optimal pattern of distribution.

distribution model A model used to determine the optimal pattern of distribution across different carriers and routes

game theory A planning tool used to predict how competitors will react to various activities that an organization might undertake

Game Theory **Game theory** was originally developed to predict the effect of one company's decisions on competitors. Models developed from game theory are intended to predict how a competitor will react to various activities that an organization might undertake, such as price changes, promotional changes, and the introduction of new products. If Wells Fargo Bank were considering raising its prime lending rate by 1 percent, it might use a game theory model to predict whether Citicorp would follow suit. If the model revealed that Citicorp would do so, Wells Fargo would probably proceed; otherwise, it would probably maintain the current interest rates. Unfortunately, game theory is not yet as useful as it was originally expected to be. The complexities of the real world combined with the limitation of the technique itself restrict its applicability. Game theory, however, does provide a useful conceptual framework for analyzing competitive behavior, and its usefulness may be improved in the future.

Artificial Intelligence A fairly new addition to the manager's quantitative tool kit is **artificial intelligence (AI)**. The most useful form of AI is the expert system.[7] An expert system is essentially a computer program that attempts to duplicate the thought processes of experienced decision makers. For example, Hewlett-Packard has developed an expert system that checks sales orders for new computer systems and then designs preliminary layouts for those new systems. HP can now ship the computer to a customer in components for final assembly on site. This approach has enabled the company to cut back on its own final-assembly facilities.

artificial intelligence (AI) A computer program that attempts to duplicate the thought processes of experienced decision makers

■ Strengths and Weaknesses of Planning Tools

Like all issues confronting management, planning tools of the type described here have several strengths and weaknesses.

Weaknesses and Problems

One weakness of the planning and decision-making tools discussed in this appendix is that they may not always adequately reflect reality. Even with the most sophisticated and powerful computer-assisted technique, reality must often be simplified. Many problems are also not amenable to quantitative analysis because important elements of them are intangible or nonquantifiable. Employee morale or satisfaction, for example, is often a major factor in managerial decisions.

The use of these tools and techniques may also be quite costly. For example, only larger companies can afford to develop their own econometric models. Even though the computer explosion has increased the availability of quantitative aids, some expense is still involved and it will take time for many of these techniques to become widely used. Resistance to change also limits the use of planning tools in some settings. If a manager for a retail chain has always based decisions for new locations on personal visits, observations, and intuition, she or he may be less than eager to begin using a computer-based model for evaluating and selecting sites. Finally, problems may arise when managers have to rely on technical specialists to use sophisticated models. Experts trained in the use of complex mathematical procedures may not understand or appreciate other aspects of management.

Strengths and Advantages

On the plus side, planning and decision-making tools offer many advantages. For situations that are amenable to quantification, they can bring sophisticated mathematical processes to bear on planning and decision making. Properly designed models and formulas also help decision makers "see reason." For example, a manager might not be inclined to introduce a new product line simply because she or he doesn't think it will be profitable. After seeing a forecast predicting first-year sales of one hundred thousand units coupled with a breakeven analysis showing profitability after only twenty thousand, however, the manager will probably change her or his mind. Thus, rational planning tools and techniques force the manager to look beyond personal prejudices and predispositions. Finally, the computer explosion is rapidly making sophisticated planning techniques available in a wider range of settings than ever before.

The crucial point to remember is that planning tools and techniques are a means to an end, not an end in themselves. Just as a carpenter uses a hand saw in some situations and an electric saw in others, a manager must recognize that a particular model may be useful in some situations but not in others that may call for a different approach. Knowing the difference is one mark of a good manager.

Summary of Key Points

Managers often use various tools and techniques as they develop plans and make decisions. Forecasting is one widely used method. Forecasting is the process of developing assumptions or premises about the future. Sales or revenue forecasting is especially important. Many organizations also rely heavily on technological forecasting. Time-series analysis and causal modeling are important forecasting techniques. Qualitative techniques are also widely used.

Managers also use other planning tools and techniques in different circumstances. Linear programming helps optimize resources and activities. Breakeven analysis helps identify how many products or services must be sold to cover

costs. Simulations model reality. PERT helps plan how much time a project will require.

Other tools and techniques are useful for decision making. Constructing a payoff matrix, for example, helps a manager assess the expected value of different alternatives. Decision trees are used to extend expected values across multiple decisions. Other popular decision-making tools and techniques include inventory models, queuing models, distribution models, game theory, and artificial intelligence.

Various strengths and weaknesses are associated with each of these tools and techniques, as well as with their use by a manager. The key to success is knowing when each should and should not be used and knowing how to use and interpret the results that each provides.

APPENDIX NOTES

1. For a classic review, see John C. Chambers, S. K. Mullick, and D. Smith, "How to Choose the Right Forecasting Technique," *Harvard Business Review*, July–August 1971, pp. 45–74.
2. Charles Ostrom, *Time-Series Analysis: Regression Techniques* (Beverly Hills, Calif.: Sage Publications, 1980).
3. Fred Kerlinger and Elazar Pedhazur, *Multiple Regression in Behavioral Research* (New York: Holt, 1973).
4. Chambers, Mullick, and Smith, "How to Choose the Right Forecasting Technique"; see also J. Scott Armstrong, *Long-Range Forecasting: From Crystal Ball to Computers* (New York: Wiley, 1978).
5. Edward Hannan, Linda Ryan, and Richard Van Orden, "A Cost-Benefit Analysis of Prior Approvals for Medicaid Services in New York State," *Socio-Economic Planning Sciences*, 1984, Vol. 18, pp. 1–14.
6. Ramon L. Alonso and Cline W. Fraser, "JIT Hits Home: A Case Study in Reducing Management Delays," *Sloan Management Review*, Summer 1991, pp. 59–68.
7. Beau Sheil, "Thinking about Artificial Intelligence," *Harvard Business Review*, July–August 1987, pp. 91–97; and Dorothy Leonard-Barton and John J. Sviokla, "Putting Expert Systems to Work," *Harvard Business Review*, March–April 1988, pp. 91–98.

Photo Credits

Part One: pp. 2-3: Jason Fulford; *Chapter 1*: p. 5: ReutersNewMedia Inc./CORBIS; p. 7: Jonathon Saunders; p. 14: Jim Sulley/WirePix/The Image Works; p. 18: Michael Lewis; p. 26: Jean-François Campos/Agence VU. *Chapter 2*: p. 35: Carol Lundeen; p. 36: Susan Van Etten; p. 40: Corbis/Bettmann; p. 45: AT&T Archives; p. 52: Munshi Ahmed; p. 56: Mark Richards. *Part Two*: pp. 66-67: Juliana Thomas; *Chapter 3*: p. 69: Spencer Grant/PhotoEdit; p. 72: Radhika Chalasani/SIPA; p. 82: Olivier Laude; p. 85: AP/Wide World Photos; p. 89: Paxton. *Chapter 4*: p. 101: Galen Rowell/CORBIS; p. 104: Brian Coats; p. 111: AP/Wide World Photos; p. 117: Reuters/Emelio Guzman/Archive Photos; p. 121: Robert Wright. *Chapter 5*: p. 131: Fujifotos/The Image Works; p. 135: Ronnie Kamin/PhotoEdit; p. 141: Christopher Liu/China Stock; p. 145: © Ami Vitale/Newsmakers/Liaison Agency; p. 155: Morad Bouchakour/UNIT Creative Management. *Chapter 6*: p. 163: William Mercer McLeod; p. 165: Mark Richards; p. 166: Girl Ray; p. 172: Fergus Greer/ICON International; p. 183: AP/Wide World Photos. *Part Three*: pp. 192–193: Gail Albert Halaban/SABA; *Chapter 7*: p. 195: Tom Ulman/Liaison Agency; p. 202: Deborah Mesa-Pelly; p. 210: George Steinmetz; p. 214: Gerry Gropp; p. 216: Alex Tehrani. *Chapter 8*: p. 227: Leslie Hugh Stone/The Image Works; p. 229: Evan Kafka; p. 239: AP/Wide World Photos; p. 240: Rex Rystedt; p. 243: Mason Morfit. *Chapter 9*: p. 259: Carol Lundeen; p. 262: AP/Wide World Photos; p. 263: Reuters/Archive Photos; p. 269: Karen Kuehn/Matrix; p. 277: Andy Freeberg. *Chapter 10*: p. 287: David Grahm; p. 288: Lara Jo Regan/SABA Press; p. 291: Chris Usher/Corbis Sygma; p. 294: Republished with permission of Globe Newspaper Company, Inc. from the May 10, 2000 issue of *The Boston Globe* © 2000. Photo by David L. Ryan; p. 307: Gail Albert Halaban/SABA. *Part Four*: pp. 322–323: Robert Wright; *Chapter 11*: p. 325: © 2000 PhotoDisc, Inc. All rights reserved. p. 327: Eli Reichman; p. 336: Michael Newman/PhotoEdit; p. 341: Luc Choquer/Metis Images; p. 348: David Fields. *Chapter 12*: p. 355: AFP/Corbis; p. 356: Thomas Hart Shelby; p. 360: Mark Richards/PhotoEdit; p. 365: Gendolyn Cates; p. 376: Scott Goldsmith. *Chapter 13*: p. 385: Will Hart/PhotoEdit; p. 387: Richard Baker/IPG/Matrix; p. 391: Dana Smith/Black Star; p. 394: Steven Ahlgren; p. 402: AP/Wide World Photos. *Chapter 14*: p. 417: AP/Wide World Photos; p. 421: Steve Woit; p. 425: Erin Patrice O'Brien; p. 430: Greg Girard/Contact Press Images; p. 437: Sarah A. Friedman. *Part Five*: pp. 452–453: Kiho Park/Kistone; *Chapter 15*: p. 455: Mark Richards; p. 457: Michael K. Nichols/National Geographic Image Collection; p. 463: Reuters/Archive Photos; p. 474: Sarah A. Friedman; p. 479: Reuters/HO/Archive Photos. *Chapter 16*: p. 487: Kristine Larsen; p. 492: Andre Lambertson/SABA; p. 494: Mark Richards; p. 507: Kenneth Jarecke/Contact Press Images; p. 510: Pham. *Chapter 17*: p. 519: Mark Wilson/Newsmakers/Liaison Agency; p. 523: Dana Fineman/SYGMA; p. 527: Michael O'Neill/Corbis Outline; p. 534: Makoto Ishida; p. 541: Todd Warshaw/ICON Sports Media. *Chapter 18*: p. 553: © 2000 PhotoDisc, Inc. All rights reserved.; p. 555: Ken Martin/Impact Visuals; p. 557: Steven Ahlgren; p. 561: Olivier Laude/Liaison Agency; p. 567: John Wiltse. *Chapter 19*: p. 583: Courtesy of Fastener Supply Company; p. 586: Phillippe Diederich; p. 588: Liaison/Newsmakers/Online USA; p. 596 Will Panich/Courtesy of Baxter International; p. 602: Reuters NewMedia, Inc./Corbis *Part Six*: pp. 612–613: Chack Savage/CORBIS Stock Market; *Chapter 20*: p. 615: © 2000 PhotoDisc, Inc. All rights reserved; p. 618:

Chris Gimble, Starbucks Coffee; p. 624: Jeff Jacobson; p. 626: Todd Buchanan; p. 627: Nikolai Ignatiev/Network/SABA Press Photos; p. 635: Christopher Hornsby. *Chapter 21*: p. 647: Courtesy of Hartmann Luggage; p. 648: Mark Richards/PhotoEdit; p. 655: Louis Psihoyos/Matrix; p. 657: Jason Grow/SABA; p. 659: Bernd Auers; p. 663: Jason Fulford. *Chapter 22*: p. 679: Reprinted with permission of Highsmith, Inc.; p. 683: Emily Mott; p. 688: Greg Girard/CONTACT Press Images; p. 697: Reprinted with permission of *Newsweek* Magazine. All rights reserved.; p. 702: AP Wide World Photos.

Name Index

Abrahamson, Eric, 414n12
Abramson, Patty, 308
Abresch, Chad, 707n1
Adams, Henry, 215
Adams, J. Stacy, 516n18
Adams, Marc, 190n15
Adams, Scott, 56
Adorno, T. W., 485n9
Aeppel, Timothy, 526n
Ahearne, Michael, 610n20
Ahlvarsson, Ola, 542
Ahuja, Manju K., 707n17
Akin, Gib, 414n12
Alderfer, Clayton P., 516n10
Alexander, Jeffrey A., 415n27
Alfarabi, 38
Allen, Joseph, 581n32
Allen, Kent, 324
Allen, Michael G., 257n31
Allen, Oliver E., 65n16
Allen, Robert, 601
Allio, Robert J., 257n31
Allred, Brent B., 32n9
Alonso, Ramon L., 727n6
Ambrose, Maureen L., 516n2
Ambur, Sonja, 426
Amihud, Yakov, 256n21
Anders, George, 32n
Anderson, Erin, 645n27
Anderson, Henry R., 645n14, 645n17, 645n19
Anderson, Jerry W., Jr., 129n18
Anderson, Julie, 277
Andrews, Fred, 374n
Andrews, Gerald, 414n16
Andrews, Kenneth, 256n2
Ansoff, Igor, 256n2
Archibald, Nolan, 558
Armenakis, Achilles A., 414n2
Armour, Stephanie, 182n, 426n, 451n18, 509n, 599n
Armstrong, J. Scott, 727n4
Aronoff, Craig E., 581n29
Ash, Mary Kay, 310
Ashmos, Donde P., 65n31
Atkinson, Anthony A., 99n25
Austin, James T., 414n18
Austin, Nancy, 581n23

Babbage, Charles, 39, 64n10
Bacharah, Dnaiel G. G., 485n33
Bahls, Jane Easter, 190n16
Bailey, Diane E., 610n8
Baily, Martin Neil, 677n10
Baker, Douglas, 382n16
Baldes, J. J., 516n20
Ball, Jeffrey, 361n, 707n
Ballmer, Steve, 15
Baloff, Nicholas, 285n27
Bamesberger, Ann, 82
Barnard, Chester, 41, 42, 43, 65n19
Barnett, Megan, 374n
Barney, Jay B., 98n4, 190n4, 256n9, 256n10, 257n24, 383n24
Baron, Talila, 190n, 450n
Barrett, Amy, 462n
Barrick, Murray R., 484n6, 610n13
Barry, Bruce, 611n26
Barry, David, 33n15
Barry, Norman, 128n2
Bartlett, Christopher A., 32n3, 65n29, 161n6, 161n11
Baskin, Otis W., 581n29
Bass, Bernard M., 550n10
Bass, R. E., 65n31
Bate, Paul, 415n24
Baum, Joel A. C., 99n16
Bazerman, Max H., 129n27
Beach, Dennis, 552
Becker, Thomas E., 580n3
Beckhard, Richard, 415n31
Bedeian, Arthur G., 353n22, 414n2
Bednar, David, 677n17
Beebe, Andrew, 311
Beeman, Don R., 551n41, 551n44
Beer, Michael, 414n5
Beeson, John, 450n6
Behling, Orlando C., 677n21
Beinhocker, Eric D., 98n3, 256n17
Bell, Cecil H., Jr., 415n33
Benfari, Robert C., 550n9
Bensaou, M., 677n13
Berenson, Alex, 83n
Berger, Warren, 542n
Bergmann, Thomas, 610n23
Berman, Ronald W., 431n
Berner, Robert, 352n
Berrando, Luis, 76
Bethune, Gordon, 486–487, 585
Bettis, R. A., 257n31
Bezos, Jeff, 6, 21, 31–32, 240, 299
Bhide, Amar, 320n13
Bich, Marcel, 300
Bies, Robert J., 551n42
Bigley, Gregory A., 516n2
Bildman, Lars, 106–107
Bishop, David, 404
Bishop, James Wallace, 610n18
Blackburn, Joseph D., 677n11
Blackburn, Richard J., 353n35
Blake, Robert R., 528n, 550n15
Blake, Stacy, 190n18
Bluedorn, Allen C., 99n14
Blum, Terry C., 485n31
Bobocel, D. Ramona, 285n22
Boeker, Warren, 414n6
Bogdanov, Vladimir, 699
Bogosian, Brian, 74
Boisot, Max, 451n24
Bond, Michael Harris, 485n11
Bordry, Isabelle, 341
Borrus, Amy, 108n
Boudette, Neal E., 267n
Bourgeois, L. J., 610n22
Bove, Courtland L., 581n28
Bowen, David, 677n22
Brady, Diane, 591n
Brady, Mike, 617n
Bravin, Jess, 698n
Breaugh, James A., 450n10
Breazeal, Cynthia, 657
Bretz, Robert, 551n39
Brews, Peter J., 224n3
Bridges, William, 382n10
Brief, Arthur P., 415n23
Bristow, Nigel J., 64n4
Brodsky, Norm, 342–343, 353n31
Bromiley, Philip, 285n24
Brooker, Katrina, 224n1, 450n, 550n
Brown, Eryn, 516n7
Brown, John, 581n13
Brown, Leonard, 74
Brown, Nicola J., 284n11
Brown, Shona L., 353n2
Brown, Tom, 382n13
Bruns, William, J., Jr., 707n5
Brynjolfsson, Erik, 414n13
Buchana, Leigh, 707n1
Buckley, Reid, 581n8, 581n11
Buckley, Walter W., III, 462
Bulkeley, William, 299n
Burke, W. Warner, 415n32
Burnham, David H., 516n14
Burns, James MacGregor, 551n35
Burns, Lawton, 383n28
Burns, Tom, 363, 382n11
Burt, H. E., 550n14
Bush, George W., 6
Butler, Brian, 707n15
Butler, Timothy, 33n20
Butterfield, D. Anthony, 190n10
Byrne, John A., 256n

Cage, Jack H., 551n27
Caggiano, Mike, 509
Caldera, Louis, 573

Caldwell, James C., 645n14, 645n17, 645n19
Calloway, Wayne, 35
Campbell, Andrew, 225n24
Campion, Michael, 610n12
Capell, Kerry, 160n
Capellas, Michael, 14
Carley, Kathleen M., 707n17
Carlton, Jim, 299n
Carnegie, Andrew, 37
Carneville, Anthony, 191n33
Carone, Christa, 182
Carp, Daniel A., 465
Carreño, Lisa Gueda, 679
Carroll, Stephen J., 33n15
Cartwright, Dorwin, 550n5, 610n3
Case, Steve, 15, 226, 346
Cashman, J. F., 551n28
Cavanagh, Gerald F., 110n, 129n9
Cavanaugh, Teresa, 312–313
Chakravarthy, Balaji S., 99n20, 224n16
Challenger, John, 617
Chambers, John, 244, 312, 727n1, 727n4
Chan, Alice P., 707n15
Chandler, Alfred, 256n18, 256n21, 256n22
Charan, Ram, 33n14
Chemers, M. M., 551n19
Chen, Christine Y., 129n16, 232n
Cheng, Mei-Lin, 277
Chiat, Jay, 542
Chickering, William J., 47
Childs, Ted, 189
Choi, Thomas Y., 677n21
Chouinard, Yvon, 100–101
Chowdhury, Neel, 407n
Christensen, Clayton M., 391, 414n11
Christensen, Sandra L., 191n24
Churchill, Winston, 37
Cinader, Arthur, 337
Clancy, John J., 485n13
Clark, Greg, 275
Cleary, Charles, 216
Clifford, Mark, 564n
Coch, Lester, 415n21
Cohen, A. R., 517n29
Cohen, Alan, 484n
Cohen, Susan G., 610n8
Cohn, Laura, 42n
Coleman, Henry J., Jr., 383n30
Collins, Jim, 224n5, 550n2
Collins, Judith M., 610n14
Collins, Paul D., 284n8
Colvin, Geoffrey, 22n, 33n14, 450n
Conger, Jay A., 551n32
Conlin, Michelle, 173n, 484n
Conlin, Robert, 707n
Coons, A. E., 550n13
Cooper, C. L., 484n2
Cooper, Robin, 677n4
Copple, Brandon, 64n
Corbett, Charles J., 677n11
Corner, Patricia, 284n19
Correll, A. D., 387–388
Cosier, Richard A., 285n32
Covey, Stephen, 56
Cox, Taylor H., 184n, 190n18, 191n35
Crainer, Stuart, 57n
Cramton, Catherine Durnell, 33n15
Cronin, Mary, 707n10
Crowston, Kevin, 353n34, 382n16
Cullen, John, 382n16
Cummings, Larry L., 485n10
Cummins, Robert, 581n12
Curie, Irene, 474–475
Curie, Pierre and Marie, 474–475
Curry, Lynne, 516n
Cutcher-Gershenfeld, Joel, 414n4

Daft, Douglas, 275, 579–580
Daft, Richard L., 353n18, 353n28
Dalton, Dan R., 353n24
Dansereau, Fred, 538, 551n28
Danzig, Richard, 573
Dash, Darien, 492
Daus, Catherine S., 191n34
D'Aveni, Richard, 382n19
David, Fred, 224n9
Davis, Chuck, 495
Davis, James H., 33n18
Davis, Keith, 569n, 581n19
Davis, Luke, 26
Davis, Ralph C., 337, 353n21
Davis, Stanley M., 383n25, 383n27
Dawley, Heidi, 160n
Day, David V., 551n29
De Geus, Arie, 98n2
De Mersan, Clothide, 341
Deal, Terrence E., 190n2
Dean, James, 677n22
Dearlove, Des, 57n
Dechant, Kathleen, 190n8
DeFrank, Richard S., 485n26
Delany, John Thomas, 382n4
Delbecq, Andre L., 285n28
Dell, Michael, 570
DeMarie, Samuel, 677n16
Deming, W. Edwards, 677n18
DeNisi, Angelo S., 65n36, 450n2, 451n1-, 517n30, 517n34, 581n21
Desmond, Edward W., 707n4
Dess, Gregory, G., 550n3
Dickson, William J., 65n24, 516n6
Digh, Patricia, 129n6
D'Innocenzio, Anne, 337n
Dion, Celine, 83
DiSanzo, Frank J., 707n16
Disney, Walt, 167, 310, 327
Dixon, Gregg, 510
Doebele, Justin, 516n
Doherty, Elizabeth M., 285n27
Donaldson, Bill, 283–284
Donaldson, Lex, 33n18
Donaldson, Thomas, 128n3, 129n10
Dooner, John J., Jr., 465
Dorf, Michael, 304
Douglass, Frederick, 475
Dowling, William F., 382n6
Drake, Edwin, 215
Dreyfuss, Joel, 173n, 677n20
Drucker, Peter F., 64n2
Duell, Charles, 215
Duffy, Daintry, 475n
Duhaime, Irene M., 256n20
Duimering, P. Robert, 414n3
Dumaine, Brian, 580n1, 587, 610n7, 610n8, 667n
Duncan, R., 415n39
Dunfee, Thomas W., 128n3
Dunning, John H., 161n6
Dunny, Jim, 215
Dutt, James, 523

Eaton, Robert, 361
Echikson, William, 237n, 302n, 542n
Edison, Thomas, 475
Edmunds, Gladys, 315
Egelhoff, William G., 383n34
Eisenberg, Eric M., 581n35
Eisenhardt, Kathleen M., 65n33, 256n2, 257n26, 353n2, 610n22
Eisner, Michael, 15, 130
Elbing, Alvar, 284n9
Elkind, Peter, 611n29
Elofson, Greg, 284n20, 581n16
Elsbach, Kimberly D., 284n20, 581n16
Elston, Mark, 672
Emerson, Harrington, 40, 41, 42
Espinoza, Luis, 296
Ettlie, J. E., 415n39
Evans, Martin G., 534, 551n21

Fain, Richard, 223–224
Farrell, Greg, 352n
Favre, Brett, 598
Fayol, Henri, 41, 42, 43, 65n17
Feldman, Daniel C., 610n16
Feldman, Steven P., 415n44
Ferguson, Kevin, 314n
Ferguson, Marilyn, 6
Fernandez-Araoz, Claudio, 450n9
Ferracone, Robin A., 500
Festinger, Leon, 485n12
Fiedler, Fred E., 531–534, 535, 550n17, 551n19, 551n20
Field, R. H. George, 551n27
Fielding, Gordon J., 353n24
Fields, Debbie, 6
Fierman, Jaclyn, 451n17
Finney, Martha I., 64n6, 285n26
Fiol, C. Marlene, 191n23
Fiorina, Carly, 6, 11, 12, 14, 25, 168, 529, 530
Fiorito, Jack, 382n4
Firstenberg, Iris R., 64n12
Fisher, Anne, 32n7, 414n9
Fisher, George, 261
Fishman, Charles, 224n, 450n1, 610n
Flanary, David, 295
Fleishman, Edwin A., 550n14
Follett, Mary Parker, 44, 45
Fondas, Nanette, 64n7

Ford, Henry, 288, 297, 310, 327
Ford, Robert, 353n14
Forehand, Joe W., 396
Foreman, Peter O., 610n13
Forest, Stephanie Anderson, 320n
Forrester, Russ, 517n27
Forward, Gordon, 552–553, 554
Fossum, John A., 451n23
Fouts, Paul A., 129n32
Fox, Justin, 581n31
Fox, Kenneth A., 462
France, Mike, 108n
Fraser, Cline W., 727n6
Fredrickson, James W., 285n30
Free, Jerry, 292–293
Freeman, Bertha, 425
Freeman, R. Edward, 129n10
French, John R. P., Jr., 415n21, 550n5
French, Wendell L., 415n33
Frenkel-Brunswick, E., 485n9
Friedman, Milton, 115, 485n24
Frink, Dwight, 610n19
Frohman, Alan L., 414n7
Froot, K. A., 225n18
Frost, Peter, 610n4
Fuller, R. Buckminister, 215

Gabarro, John J., 580n2
Gabor, Andrea, 353n7
Gadon, H., 517n29
Galbraith, Jay R., 353n36
Galpin, Timothy, 190n7
Galunic, D. Charles, 65n33, 257n26
Galuszka, Peter, 649n
Galvan, Arturo, 139
Galvin, Christopher, 4–5, 6, 9, 25
Galvin, Paul, 4
Galvin, Robert, 4
Gandz, Jeffrey, 551n40, 551n43
Gantt, Henry, 40, 41, 42, 48
Gardner, Donald G., 485n10
Gardner, William L., 551n42
Gardner family, 312
Garicunas, A. V., 336
Garnett, Katrina, 312
Garvin, David A., 663n
Gates, William (Bill), 15, 215, 289, 3*0, 600
Gatewood, Robert, 450n7
Gault, Stanley, 526
Gavin, Mark B., 485n19
George, Jennifer M., 485n19
Georgopoules, B. S., 99n23
Gerloff, Edwin, 581n12
Gersick, Connie J. G., 414n15, 610n11
Gerstner, Charlotte R., 551n29
Gerstner, Louis V., 108, 189
Ghoshal, Sumantra, 32n3, 65n29, 161n6, 161n11, 645n24
Gibara, Sam, 526
Gilbert, Jacqueline A., 190n18
Gilbreth, Frank, 40, 41, 42
Gilbreth, Lillian, 40, 41, 42
Gilson, Lucy L., 485n31
Gist, Marilyn E., 485n8
Givens, David, 581n26
Givens, Tongula, 113
Glaister, Keith W., 284n11
Glaser, Milton, 542
Glew, David J., 516n25
Goldberg, Beverly, 98n2
Goldberg, L. R., 484n5
Goldman, Seth, 229
Goleman, Daniel, 550n4
Goodnight, Jim, 416, 418
Gopinath, C., 580n3
Gordon, Joanne, 396n, 658n
Gowan, Mary, 450n7
Graen, George, 538, 551n28
Graham, Baxter W., 517n28
Graham, John, 284n
Graicunas, A. V., 353n20
Grant, Linda, 129n14
Greco, Susan, 320n25
Green, Heather, 108n
Greenberg, Herb, 299n
Greenberg, Jerald, 353n5
Greenemeier, Larry, 396n
Greenfeld, Karl Taro, 299n
Greenwald, Bruce, 677n38
Griffin, Ricky W., 65n28, 65n36, 98n7, 151n, 161n2, 161n4, 161n17, 161n18, 161n26, 353n5, 353n8, 353n11, 383n34, 450n2, 485n29, 516n25, 517n30, 517n34, 610n2
Grints, Keith, 550n4
Gross, Neil, 649n
Grossman, Robert J., 190n
Grove, Andrew, 37
Grundy, Steven and Andy, 304–305
Gumbel, Peter, 495n
Gunn, Eileen P., 161n20
Gustafson, David H., 285n28
Gustafson. Loren, 677n16
Guth, Robert A., 83n
Guzzo, Richard A., 415n23

Hackman, J. Richard, 285n29, 331n, 353n15
Hadary, Sharon, 314
Haga, W. J., 551n28
Hagedoorn, John, 98n10
Hager, George, 672n
Hall, Edward J., 581n27
Hall, W. K., 257n31
Hamel, Gary, 33n19, 56, 57, 256n6, 320n1, 374n
Hamilton, David P., 530n
Hamilton, Ian, 337, 353n21
Hamm, Mia, 598
Hammer, Michael, 383n29
Hamner, Ellen P., 516n23
Hamner, W. Clay, 516n23
Hanlon, Dan, Dave, and Jennie, 298
Hannan, Edward, 727n5
Harding, David, 284n1
Harper, Charles M., 63
Harrington, Ann, 275n
Harris, Bill, 22
Harris, E. F., 550n14
Harris, Elana, 429n
Harrison, E. Frank, 284n5
Harrison, Jeffrey S., 129n10
Hartke, Darrell D., 551n20
Hartmann, Joseph, 646
Harvey, Michael, 645n9
Hedley, Barry, 257n29
Heffernan, Paul, 384
Heifetz, Ronald A., 550n2
Heilman, Madeline E., 551n27
Helft, Miguel, 32n
Heller, Jenny, 682n
Helliker, Kevin, 352n
Hempel, C. G., 65n31
Henderson, Bruce, 257n29
Henderson, Lisa, 314
Henkoff, Ronald, 677n27
Herschlag, Judith K., 551n37
Herzberg, Frederick, 353n13, 493–494, 516n11
Heuper, W.C., 215
Hewlett, Bill, 167
Hickman, Jonathan, 232n
Hickson, David J., 382n14
Higgs, A. Catherine, 610n12
Highsmith, Duncan, 678
Hildebrand, Karen, 191n30
Hilfiger, Tommy, 78
Hill, Charles W. L., 224n13, 256n5, 320n20, 382n17, 645n10
Hill, Diane, 189
Hill, Sam, 57
Hills, Frederick S., 517n34
Hills, Roderick M., 614
Hippel, Eric von, 415n22
Hitt, Michael A., 33n17, 414n5
Hoag, Anne, 707n15
Hochwarter, Wayne A., 224n7
Hodgkinson, Gerard P., 284n11
Hofer, Charles W., 250n
Hoffman, James, 383n24
Hofstede, Geert, 150–152, 161n29, 161n31
Holloway, Michael, 295
Homer, 37
Hornstein, Harvey A., 551n27
Horovitz, Bruce, 113n, 382n
Hoskisson, Robert E., 383n24
House, Robert J., 516n12, 534, 541, 551n21, 551n32
Hower, Roger J., 415n35
Hu, Jim, 130n
Huber, George P., 65n31, 284n7, 284n9
Huber, Richard, 283
Hulin, Charles, 485n14
Hunt, J. G., 551n28, 551n32
Hunt, Michelle R., 224n3
Hunter, John E., 450n11
Hutheesing, Nikhil, 404n
Hyder, Barbara, 203

Iacocca, Lee, 56
Iaquinto, Anthony L., 285n30
Idei, Nobuyuki, 527

Iger, Robert A., 15
Ivancevich, John M., 190n18, 485n26
Ivester, M. Douglas, 579

Jackson, Phil, 541
Jacob, Karl, 311
Jaffe, Greg, 573n
Jago, Arthur G., 536, 550n2, 551n23, 551n25, 551n26
James, Robert M., 225n20
Jamison, Gail, 646
Janis, Irving L., 285n33, 285n34
Jarley, Paul, 382n4
Jassawalla, Avan R., 610n11
Jenkins, John, 582, 584
Jermier, John M., 551n30
Jobs, Steve, 406
John Paul II (pope), 6
Johnson, Celeste, 312
Johnson, Craig, 707n1
Johnson, Ross, 677n17
Johnson, Roy S., 190n14
Jonas, H., 65n31
Jones, Del, 42n, 625n
Jones, Gareth R., 99n21, 99n24, 224n13, 256n5, 320n20, 353n3, 382n2, 382n7, 382n17, 485n19
Joplin, Janice R. W., 191n34
Judge, Timothy A., 484n6, 551n39
Judge, William Q., 224n2

Kahn, Jeremy, 128n5
Kahn, Robert L., 610n13, 610n15
Kahn, William, 353n29
Kahwajy, Jean L., 610n22
Kanigel, Robert, 65n16
Kantrow, Alan M., 64n8, 458
Kanungo, Rabindra N., 551n32
Karnitschnig, Matt, 361n
Kasl, Stanislav, 485n22
Kast, Fremont E., 65n31, 65n34
Katz, David, 610n13
Katz, Robert L., 32n11
Keats, Barbara, 284n19
Keeler, Andrew, 483
Keenan, Bill, 495
Keil, Mark, 285n23
Kelleher, Herb, 24, 166, 549–550
Kelley, H. H., 485n21
Kelly, James, 10
Kelly, John M., 485n28
Kelvin, Lord, 215
Kendall, L. M., 485n14
Kendrick, John W., 677n29
Kennedy, Allan A., 190n2
Kerlinger, Fred, 727n3
Kerr, Steven, 551n30
Kerschlag, Judith K., 551n27
Kettinger, William J., 707n3
Khan, Raza, 415n24
Khurana, Anil, 677n3
Kiechel, Walter, III, 33n21, 581n14, 581n17
Kierlin, Bob, 635
Kilbridge, M. D., 353n10, 353n12
King, Neil, Jr., 698n
Kinicki, Angelo, 284n19
Kirkland, Richard I., Jr., 225n17
Kirkman, Bradley L., 610n1, 610n5
Kirkpatrick, David, 64n3, 415n26
Kirkpatrick, Shelley A., 550n11
Klein, Joel, 106
Kluger, Avraham N., 451n16
Knight, Charles, 425
Knight, Philip, 6, 384–385, 386
Knook, Pieter, 407
Knosp, Bob, 290
Koch, James, 286–287, 288
Koch, Louis, 286
Komansky, David H., 168
Komarow, Steven, 160n
Kondrasuk, Jack N., 225n25
Konopaske, Robert, 485n26
Konovsky, Mary, 485n34
Korn, Helaine J., 99n16
Kossek, Ellen Ernst, 414n4
Kotter, John P., 32n8, 56, 414n10, 521n, 550n4
Kram, Kathy, 353n29
Kramer, Michelle, 74
Krantz, Michael, 32n
Kraut, Robert, 707n15
Kreitner, Robert, 516n22, 516n23
Kripalani, Manjeet, 564n
Krishnan, M. S., 677n17
Kroc, Ray, 81, 303
Kroll, Mark, 645n7
Kulik, Carol T., 516n2
Kurland, Nancy B., 581n22
Kutner, Harold, 68

Labich, Kenneth, 284n15, 551n36
Lachman, Ran, 33n25
Lado, Augustine, 450n4
Lafley, A. G., 20
Lam, Simon S. K., 484n7
Lamont, Bruce, 383n24
Landers, Peter, 264
Landy, Frank, 485n22
Lane, Vicki R., 98n8
Langreth, Robert, 369n
Larsen, Ralph, 369
Larson, L. L., 551n28, 551n32
Latham, Gary P., 285n27, 516n20
Laudon, Jane P., 707n7, 707n8
Laudon, Kenneth C., 707n7, 707n8
Laurie, Donald L., 550n2
Lautenschlager, Gary, 450n7
Lawler, Edward E., III, 285n29, 382n13, 498, 499, 516n17, 517n31, 517n32, 645n10, 677n23
Lawrence, Paul R., 353n37, 363, 382n12, 383n25, 383n27, 415n20
Lay, Kenneth, 97
Leana, Carrie R., 353n30
Leavell, Hadley, 645n7
Lee, Gregg, 457
Lei, David, 383n33
Lengelle, Christian, 595
Lenway, Stefanie Ann, 551n45
Leonard, Bill, 517n33
Leonard, Dorothy, 415n43
Leonard-Barton, Dorothy, 727n7
Lev, Baruch, 256n21, 631
Levering, Robert, 450n
Levin, Gerald, 15, 226
Levinson, D. J., 485n9
Levy, Stuart, 495
Lewin, Kurt, 389, 414n14
Liden, Robert, 451n12
Lieber, Ronald B., 320n1
Liemandt, Joe, 292
Lientz, Bennett P., 581n32
Liker, Jeffrey K., 677n11
Likert, Rensis, 358–360, 382n5, 526–527, 550n12
Lincoln, James R., 485n16, 485n17
Lindsay, Greg, 129n16
Liska, Laurie Z., 551n22
Liu Chuanzhi, 515
Lo, Selina Y., 522
Locke, Edwin A., 285n27, 516n19, 550n11
Lohse, Deborah, 128n
London, Herb, 215
Long, Jim, 329
Loomis, Carol J., 190n5, 450n
Lorange, Peter, 224n16, 645n24
Lorenzo, Nicole, 173
Lorsch, Jay W., 32n6, 353n37, 363, 382n12, 580n2
Louie, Gilman, 312
Love, Susan, 523
Low, Murray B., 320n4
Lowry, Richard, 516n8
Lucas, George, 231
Ludewig, Eric, 293
Lundegaard, Karen, 682n
Lusch, Robert, 645n9
Luthans, Fred, 32n2, 516n22, 516n23, 516n24
Lynch, Edmund, 168
Lyness, Karen S., 190n11
Lyons, Nancy J., 320n17

MacDonald, Elizabeth, 396n
Machiavelli, Niccolo, 37, 463
MacKenzie, Scott B., 485n33, 610n20
Mackey, John, 295
MacMillan, Ian C., 256n13, 320n4
Maddi, S. R., 484n4
Maier, Norman P. R., 285n29
Main, Jeremy, 161n14, 677n24
Maney, Kevin, 87n
Manz, Charles C., 551n31
Marchand, Donald A., 707n3
Marek, Pat and Joe, 296
Markham, Steven E., 517n34
Markides, Constantinos C., 256n10, 257n28, 415n38
Marriott, Bill, 569
Martin, Christopher, 451n12
Martinez, Michelle Neely, 190n19, 517n29

Martini, Neal, 530
Martocchio, Joseph J., 484n6, 610n19
Maslow, Abraham H., 46, 48, 65n25, 490–492, 495, 496, 516n8
Massengill, Matt, 14
Mathews, John A., 383n30
Mathys, Nicholas J., 224n7
Matsunaga, Mari, 534
Matusik, Sharon F., 284n8
Maule, A. John, 284n11
Mausner, Bernard, 516n11
Maxwell, Wayne, 16
May, Jeff, 369n
Mayo, Elton, 45, 46, 48, 53, 65n24, 516n6
Mays, L. Lowry, 319–320
McCall, H. Carl, 269
McCanse, Anne Adams, 528n
McCaskey, Michael B., 581n25
McClelland, David C., 494–495, 516n13, 516n14
McCutcheon, Carl, 625
McDonald, Marci, 314n
McFarlin, F. Warren, 707n5
McGrath, Rita Gunther, 256n13
McGregor, Douglas, 46, 48, 65n26
McGuire, Jean B., 129n18
McKay, Betsy, 580n
McKim, Alan, 315
McMahan, Gary, 353n5, 353n11, 450n3
McNamara, Gerry, 285n24
McNealy, Scott, 414
Medsker, Gina, 610n12
Mehrabian, Albert, 581n24
Mehta, Stephanie N., 404n
Menzies, Hugh D., 550n6
Merrill, Charles, 168
Messick, David M., 129n27
Meyer, John, 285n22
Meyers, Bill, 314n
Miceli, Marcia P., 129n29
Middlehoff, Thomas, 346
Mieszkowski, Katherine, 484n
Miles, Grant, 383n30
Miles, Raymond E., 32n9, 234, 235–237, 238, 256n15, 383n30
Miles, Robert H., 382n15
Miller, Alex, 224n2
Miller, David W., 284n9
Miller, Scott, 361n
Milliken, Robert, 215
Milliman, John, 451n15
Millman, Joel, 76n
Mindell, Mark G., 415n35
Miner, Anne S., 353n9
Ming, Jenny, 162–163
Minor, Halsey, 22
Mintzberg, Henry, 17–19, 21, 32n10, 225n20, 256n7, 580n4, 580n5, 581n7, 581n10
Mitchell, Terence R., 485n8, 551n21
Mitchell, Vance, 610n4
Mjoen, Hans, 161n15, 645n26
Moberg, Dennis J., 110n
Mohajer, Dineh, 288
Mohr, L. B., 415n39
Mohrman, Allan, 451n15
Montealegre, Ramiro, 285n23
Montoya, Benjamin, 232
Moorhead, Gregory, 65n28, 610n2
Morgan, Peter, 166
Morito, Masao, 83
Morrison, Elizabeth Wolfe, 484n3, 551n42
Morrow, Paula C., 677n28
Morton, Michael F. Scott, 645n24
Moskowitz, Milton, 450n
Mount, Michael K., 484n6
Mouton, Jane S., 528n, 550n15
Mozart, Wolfgang Amadeus, 474
Mullane, John, 677n16
Muller, Joann, 361n
Mullick, S. K., 727n1, 727n4
Munsterberg, Hugo, 44, 45, 46, 65n22
Murphy, Chris, 294
Murray, Matt, 450n
Murray, Victor, 551n40, 551n43

Nadler, David A., 65n21, 353n4, 551n34, 591
Nasser, Jacques, 16, 518–519, 520–521
Nathan, Barry R., 451n15
Near, Janet P., 129n29
Needles, Belverd E., Jr., 645n14, 645n17, 645n19
Neider, Linda L., 551n29
Nelson, Emily, 649n
Nemetz, Patricia L., 191n24
Neubert, Ralph L., 129n18
Newmann, Peter G., 649
Newstrom, John W., 569n
Nicholas, John M., 415n37
Nishi, Kazuhiko, 600
Nobel, Barbara Presley, 451n22
Nocera, Joseph, 15n
Nohria, Nitin, 414n5
Nord, Walter, 610n4
Northcraft, Gregory, 611n24
Nottle, Judith N., 431n
Nussbaum, Bruce, 475n
Nussey, Bill, 465
Nutt, Paul, 284n4

O'Donnell, Jayne, 106n
Ohmae, Kenichi, 161n13
Oldham, Greg R., 331n, 353n15
O'Leary-Kelly, Anne M., 516n25, 610n19
Olson, Ken, 215
Ono, Yumiko, 264
O'Reilly, Brian, 10n, 98n, 285n25, 516n1
Organ, Dennis W., 485n34
Orth, Charles D., 550n9
Orwall, Bruce, 15n
Osborn, Richard N., 98n10
Ostrom, Charles, 727n2
Ouchi, William G., 56, 98n4, 257n24, 383n24, 645n22
Overdoft, Michael, 414n11
Overton, Rick, 484n
Owen, Robert, 39

Packard, David, 167
Paine, Julie Beth, 485n33
Paine, Lynn Sharp, 129n25
Palmer, Ian, 414n12
Parsons, Charles, 451n12
Parsons, T., 65n18, 382n3
Pasternick, Bruce A., 465n
Patterson, Carla, 702
Patterson, Gregory, 320n21
Patz, Alan, 415n40
Pearce, John A., II, 224n9
Pearman, Alan D., 284n11
Pedhazur, Elazar, 727n3
Pelled, Lisa Hope, 190n22, 285n31, 581n22
Penney, James Cash, 167
Pennington, Malcolm W., 257n31
Perot, H. Ross, 167, 343
Perroni, Amedeo G., 64n15
Perry, James L., 33n25
Pervin, Lawrence, 484n4
Peters, Lawrence H., 551n20
Peters, Thomas, 56, 581n23
Petersen, Andrea, 130n
Pfeffer, Jeffrey, 65n29, 516n3, 551n38
Pfeiffer, Eckhard, 20
Pfluger, William, 564
Phan, Khai Minh, 165
Phillips, Nelson, 581n13
Pickens, Joseph C., 550n3
Pierce, Jon L., 485n10
Pillai, Rajnandini, 551n35
Pinchot, Gifford, III, 415n45
Pinder, Craig, 516n4, 516n9
Pinkley, Robin, 611n24
Pinsky, Drew, 305
Pitino, Rick, 6
Pitts, Robert A., 383n33
Plato, 37, 38
Podsakoff, Philip M., 485n33, 550n9, 610n20
Pohlmann, John T., 551n20
Pollock, Ellen Joan, 74n
Poon, Dickson, 627
Port, Otis, 649n
Porter, Linda, 558
Porter, Lyman W., 285n29, 353n24, 484n4, 498, 499, 516n2, 516n17
Porter, Michael E., 56, 57, 85, 99n16, 233, 234–235, 256n2, 256n11, 256n12, 369, 382n22
Post, James, 581n15
Powell, Gary, 190n10
Power, Robert, 87
Prahalad, C. K., 33n19, 677n17
Prakash, Aseem, 129n12
Pratt, Michael G., 610n13
Presley, Elvis, 215
Preston, Lee E., 129n10
Priem, Richard, 284n2
Prietula, Michael J., 285n28
Prince, Linda S., 429
Pritchard, Beth, 200
Puffer, Sheila, 516n1