

- 14-9.** Explain the process of collaborative planning. How is available-to-promise involved?
- 14-10.** Access a major vendor of business software, such as SAP or Oracle. Read about their demand management, available-to-promise, and production planning products. What kinds of capabilities do these systems have?
- 14-11.** How is the aggregate planning process different when used for services rather than for manufacturing?
- 14-12.** What does revenue management entail? What types of businesses, besides hotels and airlines, would benefit from revenue management? As a consumer, how do you view the practice?

PROBLEMS

- 14-1.** Bioway, Inc., a manufacturer of medical supplies, uses aggregate planning to set labor and inventory levels for the year. While a variety of items are produced, a standard kit composed of basic supplies is used for planning purposes. Demand varies with seasonal illnesses and the quarterly ordering policies of hospitals. The average worker at Bioway can produce 1000 kits a month at a cost of \$9 per kit during regular production hours and \$10 a kit during overtime production. Completed kits can also be purchased from outside suppliers at \$12 each. Inventory carrying costs are \$2 per kit per month. Overtime is limited to regular production, but subcontracting is unlimited. Due to high quality standards and extensive training, hiring and firing costs are \$1500 per worker. Bioway currently employs 25 workers. Given the demand forecast below, develop a six-month aggregate production plan for Bioway using (a) chase demand and (b) a mixed strategy where the current workforce is kept for April through August, and supplemented with overtime and subcontracting as needed.

Month	Demand
April	60,000
May	22,000
June	15,000
July	46,000
August	80,000
September	15,000

- 14-2.** Demand for Quiggly Pops follows an up-and-down pattern over the four quarters of a year, with peaks in the spring and winter months when special promotions are held. Production is handled by a highly skilled local workforce during a regular 40-hour week (i.e., overtime and subcontracting are not used). The company likes to zero out its inventory at the end of a year so that it can start fresh each January. QP currently uses a level production strategy but would like to evaluate other options. Create a production plan and calculate the cost of the plan for each strategy listed below. Which plan would you recommend to QP?

- Level production
- Chase demand
- Produce 70,000 in period 1, and 100,000 in periods 2 through 4.
- Produce 90,000 in periods 1 through 3, and 100,000 in period 4.

Quarter	Demand Forecast
1	70,000
2	100,000
3	50,000
4	150,000

Beginning workforce = 40 workers
 Production per employee = 1,250 units per quarter
 Hiring cost = \$500 per worker
 Firing cost = \$500 per worker
 Inventory carrying cost = \$1 per unit per quarter
 Regular production cost = \$10 per unit

- 14-3.** Rowley Apparel, manufacturer of the famous "Race-A-Rama" swimwear line, needs help planning production for next year. Demand for swimwear follows a seasonal pattern, as shown here. Given the following costs and demand forecasts, test these four strategies for meeting demand: (a) level production with overtime and subcontracting, as needed; (b) level production with backorders as needed; (c) chase demand; and (d) 3000 units regular production from April through September and as much regular, overtime, and subcontracting production in the other months as needed to meet annual demand. Determine the cost of each strategy. Which strategy would you recommend?

Month	Demand Forecast
January	1000
February	500
March	500
April	2000
May	3000
June	4000
July	5000
August	3000
September	1000
October	500
November	500
December	3000

Beginning workforce	8 workers
Subcontracting capacity	unlimited
Overtime capacity	2000 units/month
Production rate per worker	250 units/month
Regular wage rate	\$15 per unit
Overtime wage rate	\$25 per unit
Subcontracting cost	\$30 per unit
Hiring cost	\$100 per worker
Firing cost	\$200 per worker
Holding cost	\$0.50 per unit/month
Backordering cost	\$10 per unit/month

- 14-4.** Mama's Stiffin' is a popular food item during the fall and winter months, but it is marginal in the spring and summer. Use the following demand forecasts and costs to determine which of the following production planning strategies is best for Mama's Stiffin':
- Level production over the 12 months.
 - Produce to meet demand each month. Absorb variations in demand by changing the size of the workforce.
 - Keep the workforce at its current level. Supplement with overtime and subcontracting as necessary.

Month	Demand Forecast
March	2000
April	1000

(Continued)