Chapter 1

Introduction to Managerial Accounting

ANSWERS TO QUESTIONS

1. The primary difference between financial and managerial accounting is the intended user of the information. Financial accounting is used by external parties such as investors, creditors, and regulators, while managerial accounting is used by internal business managers.
2. Different users will have different information needs, which give rise to many other differences between financial and managerial accounting. Financial accounting includes standardized financial statements that are objective, reliable, and historic in nature. These reports are prepared on a periodic basis and are reported at a highly aggregate level, for the company as a whole. Managerial accounting information is much broader in nature and can encompass budgets, performance evaluations, and cost accounting reports. The information tends to be more subjective and future-oriented in nature and must be relevant to the particular decision the manager is trying to make. The information in these reports tends to be more detailed and segmented, depending on the manager’s area of responsibility.
3. GAAP-based financial statements, which are prepared for external parties, will not necessarily be useful for internal managerial decision making. Managers often need more detailed information than is included in historically oriented financial statements. They may need the information broken down by division, business segment, or product line. In addition, managers are typically more interested in what will happen in the future, as opposed to the past. Even if the information is not as objective and verifiable as what would be included in a financial report (for example, it may include more budgeted or forecasted data), managerial accounting information must be relevant to the particular decision the manager is trying to make.
4. Service companies sell services (non-tangible items) to consumers or other businesses. Merchandising companies sell finished goods that they have purchased from someone else. Manufacturing companies make a product using raw materials, then sell it to another manufacturer, merchandising company, service company, or individual consumer.
5. Examples of service firms include hair salons, travel agents, real estate firms, law firms, dentist’s office, restaurants, etc. Merchandising companies include Walmart, GAP, Safeway, Exxon, etc. Manufacturing firms are those that produce a physical product, whether it is golf balls, furniture, clothing, computers, etc. Manufacturing facilities are often located in “industrial” or “light industrial” areas on the outskirts of metropolitan areas.
6. The three functions of management are planning, implementing, and controlling.
7. The three functions of management are interrelated in that one function will affect what happens in the next function, and the entire process provides feedback for future decision making. For example, managers must first know where they are going and what resources they will need to get there (planning) before they can begin to implement the plan. The control function provides feedback to managers about whether the plan is being achieved, so that they can take corrective action by adjusting the plan, the resources, or their implementation of the plan.
8. Ethics refers to the standards of conduct for judging right from wrong, honest from dishonest, and fair from unfair. Although some accounting and business issues have clear answers that are either right or wrong, many situations require accountants and managers to weigh the pros and cons of alternatives before making a final decision.
9. Congress enacted SOX in response to a number of high-profile scandals in which companies failed as a result of erroneous and fraudulent reporting. The act was aimed at renewing investor confidence in the external financial reporting system, but also placed additional responsibilities on company managers.
10. The Sarbanes-Oxley Act increased manager’s responsibility for creating and maintaining an ethical business and reporting environment. For example, managers must perform an annual review of their company’s internal control system and issue a report that indicates whether the controls are effective. This requirement places more responsibility on all managers (not just accountants) for reporting accuracy. The Act also emphasizes the importance of ethics by requiring public companies to adopt a code of ethics for senior financial officers.
11. The Sarbanes-Oxley Act (see Section 404) attempts to reduce fraudulent reporting in the following ways:
    * Opportunity: SOX attempts to reduce the opportunity for error and fraud by requiring an internal control report from managers, stronger oversight by the board of directors, and requiring external auditors to attest to the effectiveness of the internal controls.
    * Incentives: SOX attempts to counteract the incentive to commit fraud by providing much stiffer penalties to those who intentionally misrepresent a company’s financial performance.
    * Character: SOX emphasizes the importance of character in the prevention of fraud by requiring companies to create anonymous tip lines for reporting fraud, providing “whistle-blowers” legal protection, and requiring companies to adopt a code of ethics for senior financial officers.
12. Companies with strong ethical cultures are rewarded with higher productivity, improved team dynamics, lower risks of fraud, streamlined process, improved product quality, and higher customer satisfaction.
13. Businesses are starting to incorporate sustainability into their business models because they realize that a business strategy focused solely on achieving economic results is not sustainable in the long run. Businesses cannot survive without people (customers, employees, suppliers) and natural resources, so it makes sense to take care of both. Today’s consumers are more environmentally conscious and there is a market for sustainable products and services. Corporate social responsibility is also an emerging area as businesses have an important role to play in improving society, not just making a profit.
14. Sustainability accounting is often referred to at the triple bottom line, which is made up of three factors: the economy, the environment, and society. While traditional accounting systems measured only economic or financial performance, sustainability accounting expands it to include measures related to the environment and society.
15. "Big data" is difficult to analyze using traditional tools such as spreadsheets and databases due to the volume, variety and velocity of the data. Volume relates to the sheer size of the data. Variety relates to the fact that the data can come in many forms, including numbers, text, audio, and video. Velocity relates to the speed at which data is collected.
16. Descriptive analytics focuses on describing the data. For example, CPK might use data collected from customer loyalty programs to *describe* their typical customer in terms of age, gender and income level. Predictive analytics is used to forecast or predict something that will happen in the future. For example, CPK managers might use the demographic data for a particular zip code to *predict* sales volume for a new store. Prescriptive analytics goes beyond simply describing and prediction to prescribing or recommending actions. For example, CPK managers might use data collected in a customer survey to determine what types of menu items they should develop to appeal to their most profitable customers.
17. Answers will vary. Out-of-pocket costs are those that you pay for “out of your pocket,” whether in cash or with a credit card. It could be the cost of fuel in your car, or the cost of your lunch. Opportunity costs are the “lost benefits” you incur when you choose to do one thing instead of another. These are typically more difficult to estimate and to quantify. For example, if you rode your bike to school instead of driving, the additional time it took you to ride your bike is an opportunity cost of that decision. But to put a dollar value on it (i.e., quantify it), you would need to know how valuable your time is.
18. Cost information is critical to managerial decision making. For example, managers typically want to know what a product or service costs before they can decide what price they should charge for it. They also need to know how much something costs so they can decide whether to buy it, how much to buy, and what supplier to buy from.
19. A direct cost is one that can be traced to a specific cost object, while an indirect cost is one that either cannot be traced, or it is not worth the effort to trace the cost. Direct costs include the primary material inputs such as leather, cloth, hardware, etc. Direct costs would also include the wages of workers who were directly involved in making the product (e.g., cutting, sewing, etc.). Indirect costs are all other costs incurred to make the product such as including indirect material (e.g., thread), rent on the manufacturing facility, supervision, power to run the machines, etc.
20. Variable costs are costs that change, in total, in direct proportion to a change in activity level. Fixed costs remain the same, in total, regardless of activity level. Fuel and maintenance costs will vary in direct proportion to the number of miles you drive your car. Even though you may not pay for the maintenance costs each and every week, the more miles you drive, the more maintenance your car will need. Costs such as insurance and parking are fixed, regardless of the number of miles driven.
21. A relevant cost is one that has the potential to influence a decision; an irrelevant cost will not influence a decision. For a cost to be relevant, it must (1) differ between the decision alternatives and (2) be incurred in the future rather than in the past.
22. Relevant costs are those that will differ between these two alternatives. Examples include the cost of transportation to and from the different locations, difference in lodging costs, the cost of entertainment at each venue, etc. Irrelevant costs are those that will be incurred regardless of which alternative is chosen, such as the cost of rent and utilities at your apartment back home. If the cost of food and entertainment will be roughly the same in either location, this would be considered an irrelevant cost.
23. Direct materials and direct labor are referred to as prime costs. At one point in time direct materials and direct labor were the primary costs of making a product. As manufacturing processes have become more automated, indirect costs such as machine depreciation and factory supervision have become a larger proportion of the cost.
24. Manufacturing overhead includes all manufacturing costs other than direct material and direct labor, or any cost that is associated with manufacturing that is not directly traceable to the product. Examples include rent, supervision, insurance, utilities, and machinery in the manufacturing facility. It does not include non-manufacturing costs such as general and administrative expenses or selling expenses.
25. Prime costs are direct materials + direct labor. Conversion costs are direct labor + manufacturing overhead. You cannot add them together to arrive at total manufacturing cost because direct labor is included in both and would be “double counted.”
26. Product costs are initially recorded as inventory on the balance sheet. They are transferred to Cost of Goods Sold on the income statement when the product is sold. Period costs are expensed on the income statement as soon as they are incurred.
27. Product costs are called inventoriable costs because they are initially recorded as inventory and are not expensed until the inventory is sold. These costs are initially recorded in inventory accounts (on the balance sheet) and follow the flow of the product as it makes its way through the production process. Once the product is finally sold, the product costs are transferred to Cost of Goods Sold, where they will be matched against sales revenue on the income statement.
28. According to GAAP, all manufacturing costs must be treated as a product cost, which means the costs will be included in inventory (on the balance sheet) until the product is sold. Once the product is sold, the product costs are transferred to Cost of Goods Sold, where they will be matched against sales revenue on the income statement.
29. Since period costs are expensed in the period they are incurred, they would only appear on a company’s income statement and not its balance sheet.
30. Incorrectly classifying advertising as a product cost would overstate product cost, which could impact the balance sheet inventory accounts as well as cost of goods sold on the income statement. Since this advertising cost wasn’t expensed immediately as it should have been, total expenses on the income statement might also be understated if some of the goods haven’t been sold (i.e., some of the cost is still held on the balance sheet as inventory).

**Authors' Recommended Solution Time**

**(Time in minutes)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Mini-exercises* | | *Exercises* | | *Problems* | | *Cases and Projects\** | |
| *No.* | *Time* | *No.* | *Time* | *No.* | *Time* | *No.* | *Time* |
| 1 | 4 | 1 | 5 | PA-1 | 7 | 1 | 40 |
| 2 | 5 | 2 | 6 | PA-2 | 8 | 2 | 40 |
| 3 | 4 | 3 | 3 | PA-3 | 6 | 3 | 40 |
| 4 | 3 | 4 | 4 | PA-4 | 7 | 4 | 40 |
| 5 | 6 | 5 | 5 | PB-1 | 7 | 5 | 40 |
| 6 | 3 | 6 | 6 | PB-2 | 8 |  |  |
| 7 | 4 | 7 | 5 | PB-3 | 9 |  |  |
| 8 | 5 | 8 | 5 | PB-4 | 7 |  |  |
| 9 | 4 | 9 | 5 |  |  |  |  |
| 10 | 4 | 10 | 5 |  |  |  |  |
| 11 | 4 | 11 | 5 |  |  |  |  |
| 12  13  14  15  16 | 4  6  4  4  4 | 12  13  14  15  16  17 | 5  5  5  5  5  5 |  |  |  |  |
|  |  |  |  |  |  |  |  |

\* Due to the nature of cases, it is very difficult to estimate the amount of time students will need to complete them. As with any open-ended project, it is possible for students to devote a large amount of time to these assignments. While students often benefit from the extra effort, we find that some become frustrated by the perceived difficulty of the task. You can reduce student frustration and anxiety by making your expectations clear, and by offering suggestions (about how to research topics or what companies to select).

ANSWERS TO MINI-EXERCISES

**M1-1**

B 1. Managerial accounting is future-oriented, while financial accounting is primarily

historical in nature.

A 2. Financial accounting is used primarily by external parties.

C 3. Both financial and managerial accounting are relied on for decision making

A 4. Financial accounting is primarily historical in nature, while managerial is future-

oriented.

A 5. Financial reports can be obtained from the company website, or requested from

the company CFO.

A 6. Financial reports are typically reported in aggregate for the company as a

whole.

B 7. Managerial accountants may prepare daily reports, or even real-time reports.

B 8. Managerial accounting is used mostly by managers within the company.

C 9. Both financial and managerial accounting information should be accurate to

help with decision making.

D 10. Neither financial reports nor managerial reports are always available on the

Internet to any interested party. Annual and quarterly statements of publicly

held companies are available on the SEC website and are usually available on the company’s website. It is unusual to find the financial statements of privately owned companies on the Internet.

**M1-2**

|  |  |
| --- | --- |
| Q | 1. Budget |
| E | 2. Controlling |
| I | 3. Direct Costs |
| A | 4. Financial Accounting |
| M | 5. Fixed Costs |
| T | 6. General and Administrative Expenses |
| G | 7. Merchandising Companies |
| R | 8. Product Cost |
| O | 9. Sunk Costs |
| S | 10. Sustainability |

**M1-3**

|  |  |
| --- | --- |
| L | 1. Conversion Costs |
| S | 2. Differential Costs |
| F | 3. Indirect Costs |
| M | 4. Manufacturing Costs |
| A | 5. Manufacturing Firms |
| N | 6. Nonmanufacturing Costs |
| D | 7. Opportunity Costs |
| P | 8. Relevant Cost |
| T | 9. People, Profit, and Planet |
| H | 10. Variable Costs |

**M1-4**

The three basic functions of management are as follows:

1. Planning is the future-oriented part of the process where managers determine what they want to achieve in the short and long run and identify the resources that will be necessary to achieve the plan. For the production manager, this would include determining how many units will need to be produced during each month of the coming year in order to meet sales projections. Once the production manager knows how many units will be produced during the next year, he/she must organize the work force and make certain employees have the necessary resources (machines, materials, etc.) to achieve the plan. If not, he/she may need to hire more people, lease more machines, purchase more material, etc.
2. Implementing means putting the plan into action. As the production manager, you will need to lead and direct your employees as they work towards achieving the plan.

**M1-4 (continued)**

1. Controlling involves comparing actual results to the plan to determine whether corrective action is necessary. For example, you may find that the company is producing more units than are actually being sold, resulting in a build-up of finished goods inventory. If so, you may decide to reduce production during the following month to adjust for this issue.

**M1-5**

## C

## A

## B

## C

## B

**M1-6**

1. This is an example of an ethical dilemma. The government will be harmed because an insufficient amount of tax revenue will be collected from the client, which will in turn harm the public as well.
2. This is an example of an ethical dilemma. Both of you will be harmed if you are caught, but you will be harmed regardless of whether you are caught because without doing the homework for yourself you lose an opportunity to learn the material.
3. This is an example of an ethical dilemma. The owner(s) of the store will be harmed because of lost revenue, and both you and your manager will likely lose your jobs if you are caught.

**M1-7**

V 1. Lamp shades

V 2. Glue and screws

F 3. CEO’s salary

V 4. Assembler’s wages

F 5. Rent for the factory

F 6. Plant supervisor’s salary

F 7. Depreciation on delivery truck

V 8. Power used for welding equipment

V 9. Sales commissions

**M1-8**

1. Manufacturing overhead (MOH)
2. Period cost (P)
3. Direct material (DM)
4. Manufacturing overhead (MOH)
5. Manufacturing overhead (MOH)
6. Direct labor (DL)
7. Period (P)
8. Manufacturing overhead (MOH)
9. Period cost (P)
10. Direct labor (DL)

**M1-9**

1. Direct materials used = $1,500
2. Direct labor = $2,500 +$1,600 = $4,100
3. Manufacturing overhead = $1,800 + $2,800 + $250 + $3,500 = $8,350
4. Prime cost = $1,500 + $4,100 = $5,600
5. Conversion cost = $4,100 + $8,350 = $12,450
6. Total manufacturing costs = $1,500 + $4,100 + $8,350 = $13,950
7. Total nonmanufacturing (period) cost = $800 + $600 + $3,000 = $4,400

**M1-10**

|  |  |  |
| --- | --- | --- |
| 1. Direct material | $ 22,750 | 18,000+4,750 |
| 1. Direct labor | 15,000 | 15,000 |
| 1. Manufacturing overhead | 5,450 | 3,100+600+1,750 |
| 1. Total manufacturing cost | 43,200 | 22,750+15,000+5,450 |
| 1. Total period cost | 13,700 | 4,000+400+2,800+6,500 |
| 1. Total variable cost | 40,100 | 18,000+15,000+600+1,750+4,750 |
| 1. Total fixed cost | 16,800 | 4,000+400+3,100+2,800+ 6,500 |

**M1-11**

1. Relevant costs of pursuing a graduate degree would include the cost of tuition, books, and fees associated with the program. A major opportunity cost would be the potential salary you could earn if you got a full-time job after graduation rather than continuing to go to school. A relevant benefit is the increased salary that you would be able to earn after completing the degree. Alternatively, this could be considered an opportunity cost of NOT getting the graduate degree.
2. Irrelevant costs are those that will be incurred regardless of whether you decide to go to graduate school, such as rent (assuming you would pay the same amount under either alternative), food, clothing, car insurance, etc. If any of these costs are expected to be higher or lower if you pursue the degree, the increase or decrease would be relevant and should be factored into the decision.

**M1-12**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Product Costs** | | |  |  |
|  | **Direct Materials** | **Direct Labor** | **Manufacturing Overhead** | **Prime Cost** | **Conversion Cost** |
| Production supervisor salary |  |  | X |  | X |
| Cost of lamp shades | X |  |  | X |  |
| Wages of person who  assembles lamps |  | X |  | X | X |
| Factory rent |  |  | X |  | X |
| Wages of person who  paints lamps |  | X |  | X | X |
| Factory utilities |  |  | X |  | X |
| Screws used to assemble lamps |  |  | X |  | X |

**M1-13**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Case** | **Direct Materials** | **Direct Labor** | **Manufacturing Overhead** | **Prime**  **Cost** | **Conversion Cost** |
| A | $ 900 | $ 1,300 | $ 2,000 | $ 2,200 | $ 3,300 |
| B | 400 | 2,250 | 1,325 | 2,650 | 3,575 |
| C | 2,180 | 700 | 1,500 | 2,880 | 2,200 |
| D | 850 | 750 | 1,250 | 1,600 | 2,000 |

**M1-14**

S 1. Merry Maids

Man 2. Dell Computer

S 3. Brinks Security

Mer 4. Kmart

Mer 5. PetSmart

Man 6. Ford Motor Company

S 7. Bank One

Man 8. Ralph Lauren (also sell merchandise in factory stores)

Mer 9. Dillard’s

Mer 10. Sam’s Club

**M1-15**

Solution will vary based on the company chosen. Examples:

Merry Maids

Direct costs – wages of maids, cost of products used on a specific job

Indirect costs – cost of gas to get to job, depreciation on machinery (e.g., vacuum cleaner), salary of supervisor

Cost object is the individual house, customer, or cleaning job

Brinks Security

Direct costs – cost of security panel installed, cost of warning signs for premises, wages of system installers

Indirect costs – wages of employees who monitor multiple systems, phone lines in monitoring system, salary of team leaders/managers

Cost object is the customer or location that is being monitored

**M1-16**

Solution will vary based on the company chosen. Examples:

PetSmart

Direct costs – cost of vaccines or medications in vet clinic, cost of any merchandise that the customer purchases (food, collars, books, etc.)

Indirect costs – depreciation on equipment (cash registers, fish tanks, grooming equipment, shopping carts), store manager salary

Cost object is the individual customer

Sam’s Club

Direct costs – cost of photo paper used to print customer’s pictures, wages of tire installer

Indirect costs – wages of cashiers, rent or depreciation on building, salary of team leaders and store managers

Cost object is the individual customer

**ANSWERS TO EXERCISES**

**E1-1**

Req. 1

Potential questions that would need to be answered include:

* Is there already a product like this on the market?
* Would students be willing to buy such a product?
* What features would the product need to have?
* How much would students be willing to pay for it?
* How much would it cost to make such a product?
* How many units could we sell in the first year? The second year?
* How many units would we need to sell to make a profit?
* What kind of material would we use?
* Where would we manufacture the product? Would we make it ourselves, or buy it from someone else?
* How would we advertise the product to students?
* What type of store would sell the product?
* Is it possible to license the carts with school logos?

Req. 2

Managers would need information from potential customers (students), demographic data, market information (demand), competitor pricing information, information about the cost of material, labor, etc.

Req. 3

Potential consequences include:

* Introducing a product that has no market demand.
* Competitors already have a product that is better than what we have planned.
* Customers are not willing to pay as much as it costs us to make the product.
* We underestimate demand and lose out on potential sales, so customers go elsewhere.

**E1-2**

The following answers represent the most likely answers. But students should recognize that these functions are interrelated, and so one function may lead to the next. The important thing is that the student be able to provide a rationale for why they chose the particular category they did.

A 1. Identifying five college campuses to serve as test markets.

A 2. Setting the goal of $1 million in annual sales by the year 2018.

B 3. Hiring workers for the manufacturing facility.

B 4. Overseeing the production and shipment of The Campus Cart.

A 5. Preparing one-, three-, and five-year budgets that detail the

necessary resources and costs that will be incurred to meet the projected

sales forecasts.

C 6. Deciding which new markets to expand into based on the first year’s sales

results.

B 7. Implementing a bonus system to reward employees for meeting sales and

production goals.

C 8. Deciding to spend more advertising dollars in regions where sales were

slower than expected.

**E1-3**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **S** | **En** | **Ec** |
| 1. Implementing a health and wellness program to improve employees’ health, reduce stress, improve productivity, and reduce employee turnover. | **X** |  | **X** |
| 1. Ensuring that all future construction projects are LEED certified. |  | **X** |  |
| 1. Implementing a just-in-time inventory system to reduce inventory costs and improve product quality. |  |  | **X** |
| 1. Providing all employees with glass water bottles to reduce the use of plastic water bottles and the cost of company-sponsored lunches. |  | **X** | **X** |
| 1. Purchasing web conferencing software to give employees the flexibility to work remotely, reduce the number of miles they must commute to work, and save on travel costs for off-site meetings. | **X** | **X** | **X** |
| 1. Creating a code of conduct for suppliers to establish guidelines on labor wages, working conditions, health and safety. | **X** |  |  |
| 1. Expanding into international markets to increase market share. |  |  | **X** |

**E1-4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Relevant**  **Cost or Benefit** | **Irrelevant Cost or Benefit** | **Sunk Cost** | **Opportunity Cost** |
| $40,000 salary from Shelton | X |  |  | X |
| Anticipated $48,000 salary with an accounting degree | X |  |  | X |
| Tuition and books for years 1–3 of college |  | X | X |  |
| Cost to relocate to Seattle | X |  |  |  |
| Tuition and books for remaining two semesters | X |  |  |  |
| $19,000 from your part-time job, which you plan to keep until you graduate | X |  |  | X |
| Cost to rent an apartment in Seattle (assume you are currently living at home with your parents) | X |  |  |  |
| Food and entertainment expenses, which are expected to be the same in Seattle as where you currently live |  | X |  |  |
| Increased promotional opportunities that will come from having a college degree | X |  |  | X |

**E1-5**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Product Costs | | |  |  |
| Direct Materials | Direct Labor | Mfg.  Overhead | Variable  Cost | Fixed  Cost |
| Factory equipment depreciation |  |  | X |  | X |
| Factory supervisor salary |  |  | X |  | X |
| Factory utilities |  |  | X | X |  |
| Factory insurance |  |  | X |  | X |
| Furniture assembler wages |  | X |  | X |  |
| Furniture lumber | X |  |  | X |  |
| Glue and screws |  |  | X | X |  |
| Factory property taxes |  |  | X |  | X |

**E1-6**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Product Costs | | | Period  Cost | Variable  Cost | Fixed  Cost |
| Direct Materials | Direct Labor | Mfg.  Overhead |
| CFO salary |  |  |  | X |  | X |
| Factory utilities |  |  | X |  | X |  |
| Factory supervisor salary |  |  | X |  |  | X |
| Store equipment depreciation |  |  |  | X |  | X |
| Factory equipment depreciation |  |  | X |  |  | X |
| Advertising (monthly) |  |  |  | X |  | X |
| Model car tires | X |  |  |  | X |  |
| Store property taxes |  |  |  | X |  | X |
| Factory insurance |  |  | X |  |  | X |
| Factory worker wages |  | X |  |  | X |  |
| Marketing manager salary |  |  |  | X |  | X |
| Glue and screws |  |  | X |  | X |  |
| Machine maintenance costs |  |  | X |  | X |  |

**E1-7**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Product Costs** | | |  |  |  |  |
|  | **Direct Materials** | | **Direct Labor** | **Manufacturing Overhead** | | **Period Cost** | **Prime Cost** | **Conversion Cost** |
| Production supervisor salary |  | |  | X | |  |  | X |
| Cost of fiberglass | X | |  |  | |  | X |  |
| Wages of assembly person |  | | X |  | |  | X | X |
| Sales commission |  | |  |  | | X |  |  |
| Cost of high-grade wheels | X | |  |  | |  | X |  |
| Screws |  | |  | X | |  |  | X |
| Factory rent |  | |  | X | |  |  | X |
| Wages of skateboard painter |  | | X |  | |  | X | X |
| Factory utilities |  | |  | X | |  |  | X |
| Utilities for corporate office |  | |  |  | | X |  |  |

**E1-8**

Req. 1

Direct materials cost = $42,000 (Note: Excludes the cost of thread and buttons. These costs are probably not traced to individuals units, and are included as indirect materials, or manufacturing overhead, in Req. 3.)

Req. 2

Direct labor cost = $75,000 + $50,000 = $125,000

Req. 3

Manufacturing overhead = $42,000 + $1,000 + $22,000 + $30,000 + $750 + $15,000 + $6,000 = $116,750

Req. 4

Total manufacturing cost = $42,000 + $125,000 + $116,750 = $283,750

Req. 5

Prime cost = $42,000 + $125,000 = $167,000

Req. 6

Conversion cost = $125,000 + $116,750 = $241,750

Req. 7

Total period cost = $18,000 + $25,000 + $75,000 = $118,000

**E1-9**

|  |  |  |
| --- | --- | --- |
| 1. Direct material | $ 14,000 | 10,000+4,000 |
| 2. Direct labor | 2,000 | 2,000 |
| 3. Manufacturing overhead | 1,600 | 200+600+375+425 |
| 4. Total manufacturing cost | 17,600 | 14,000+2,000+1,600 |
| 5. Total period cost | 8,350 | 3,000+400+3,500+1,450 |
| 6. Total variable cost | 18,450 | 10,000+2,000+200+1,450+4,000+375+425 |
| 7. Total fixed cost | 7,500 | 3,000+400+3,500+600 |
| 8. Total prime cost | 16,000 | 14,000+2,000 |
| 9. Total conversion cost | 3,600 | 2,000+1,600 |

**E1-10**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case** | **Prime  Cost** | **Conversion  Cost** | **Direct  Materials** | **Direct**  **Labor** | **Manufacturing  Overhead** | **Total Manufacturing  Cost** |
| A | $3,500 | $5,000 | $2,000 | $1,500 | $3,500 | $7,000 |
| B | 6,600 | 11,500 | 2,300 | 4,300 | 7,200 | 13,800 |
| C | 4,650 | 8,000 | 1,400 | 3,250 | 4,750 | 9,400 |
| D | 3,100 | 5,200 | 1,000 | 2,100 | 3,100 | 6,200 |
| E | 11,500 | 20,500 | 3,800 | 7,700 | 12,800 | 24,300 |

**E1-11**

Req. 1

Direct labor = $82,000

Req. 2

Manufacturing overhead = $40,000 + $1,800 + $36,000 + $30,000 + $12,000 + $26,000 = $145,800

Req. 3

Prime cost = $34,500 + $82,000 = $116,500

Req. 4

Conversion cost = $82,000 + $145,800 = $227,800

Req. 5

Total Manufacturing cost = $34,500 + $82,000 + $145,800 = $262,300

Req. 6

Period expenses = $20,000 + $8,000 + $60,000 + $7,500 = $95,500

**E1-12**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Product Costs | | | | |
|  | Period Cost | Direct Materials | Direct Labor | Manufacturing Overhead | Prime Cost | Conversion Cost |
| Company president’s salary | **X** |  |  |  |  |  |
| Factory rent |  |  |  | **X** |  | **X** |
| Cost of reflective material |  | **X** |  |  | **X** |  |
| Wages of material cutter |  |  | **X** |  | **X** | **X** |
| Wages of office receptionist | **X** |  |  |  |  |  |
| Thread and glue |  |  |  | **X** |  | **X** |
| Depreciation for salesperson’s car | **X** |  |  |  |  |  |
| Factory supervisor’s salary |  |  |  | **X** |  | **X** |
| Factory utilities |  |  |  | **X** |  | **X** |
| Factory insurance |  |  |  | **X** |  | **X** |

**E1-13**

1. Total product cost = $800 +$1,100 + $2,800 + $370 + $3,000 + $1,200 + $1,950 = $11,220
2. Prime cost = $1,100 + $3,000 + 1,950 = $6,050
3. Manufacturing overhead = $800 + $2,800 + $370 + $1,200 = $5,170
4. Direct labor = $3,000 + $1,950 = $4,950
5. Conversion cost = $4,950 + $5,170 = $10,120
6. Total variable cost = $1,100 + $370 + $3,000 + $1,200 + $1,950 = $7,620
7. Total fixed cost = $800 + $100 + $2,800 + $600 + $2,500 = $6,800

**E1-14**

Req. 1

The only relevant cost is the cost of the new computer.

Req. 2

All of the “past costs” are irrelevant — cost of the old computer, cost of the add-on

components, and cost of the service agreement for the components.

Req. 3

No, Raymond’s logic is not correct. Regardless of whether he chooses to purchase a new computer or not, the money he has already paid out is gone. As things currently stand, Raymond has both a computer and add-on components that he cannot use. At least if he purchases a new computer, the add-on components can be used and perhaps would help Raymond generate additional revenue.

**E1-15**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Case | Prime  Cost | Conversion  Cost | Direct  Materials | Direct  Labor | Manufacturing Overhead | Total  Manufacturing  Cost |
| A | $9,400 | $16,100 | $4,300 | $5,100 | $11,000 | $20,400 |
| B | $19,300 | $31,800 | $12,000 | $7,300 | $24,500 | $43,800 |
| C | $55,300 | $107,500 | $43,200 | $12,100 | $95,400 | $150,700 |
| D | $34,650 | $47,350 | $21,400 | $13,250 | $34,100 | $68,750 |
| E | $32,800 | $38,000 | $17,700 | $15,100 | $22,900 | $55,700 |

**E1-16**

Students should recognize that increased automation has led to increased amounts of manufacturing overhead as depreciation and maintenance for factory machinery is added to the manufacturing overhead category. Direct labor could have decreased as a direct result of automation since a machine can often do the work of several laborers. At a minimum, the proportion of labor decreased as total manufacturing overhead increased.

**E1-17**

Advertising is a non-manufacturing (period expense) that does not affect manufacturing costs, inventory, or Cost of Goods Sold.

1. Manufacturing Costs: Unaffected

2. Inventory: Unaffected

3. Cost of Goods Sold: Unaffected

4. Period Expenses: Understated by $72,000

5. Net Income: Overstated by $72,000

**ANSWERS TO PROBLEMS – SET A**

**PA1-1**

Req.1

Two types of accounting: Financial and managerial.

1. User orientation: The purpose of accounting is to provide useful information to decision makers.
   1. Financial accounting is used by external parties (stockholders, creditors, regulators, SEC, IRS, etc.).
   2. Managerial accounting is used by internal parties (managers).
2. Types of reports:
   1. Financial accounting relies on GAAP-based financial statements (income statement, balance sheet, and statement of cash flows).
   2. Managers need a variety of reports including budgets, cost reports, and performance evaluation reports.
3. Type of information:
   1. Financial accounting tends to be objective, reliable, and historical.
   2. Managerial accounting tends to be subjective, relevant, and future-oriented.
4. Frequency of reporting:
   1. Financial reports are prepared periodically (monthly, quarterly, or annually).
   2. Managerial reports are prepared “as needed,” perhaps daily or real-time.
5. Level of analysis:
   1. Financial accounting is reported for the company as a whole.
   2. Managerial accounting reports are prepared based on the manager’s area of decision-making responsibility (e.g., by product line, by region, by department, etc.).

Req. 2

Students should be able to list at least five questions that may be asked during the presentation, along with the answer.

**PA1-2**

There are three basic functions of management. The three functions are interrelated, and some questions included in one phase may relate to another.

1. Planning (setting short and long-term objectives, and identifying the resources needed to achieve them)

Examples of questions Suzie must address in the planning stage include:

* What outdoor educational products are currently on the market and how does my product compare to those products?
* How much would consumers be willing to pay for my product?
* How much cash will I need to launch my business?
* Will I borrow the money from the bank or invest my own savings?
* How many people will I need to hire?
* How much will I have to pay them?
* How many units do I think I can sell the first year and the second year?
* How much will it cost to produce the product?
* How many units will I have to sell to break even? How long will it take?
* How will I get the product into the hands of my customers?
* How much do I need to spend on marketing?

1. Implementing (taking action to implement the plan)

Examples of questions Suzie must address in the implementation stage include:

* Will I supervise the production process myself, or hire someone else to do it?
* How much responsibility will I be able to delegate to my employees?
* How do I motivate my employees to work hard to meet production and sales goals?
* How do I deal with customer complaints?
* Should I fire an employee who is always late for work?

1. Controlling (making adjustments to the plan based on actual results)

Examples of questions Suzie might have to address in the controlling stage include:

* What happens if sales are much lower than I expected?
* What happens if I run out of cash during the first year?
* What happens if the cost of raw materials increases significantly?
* What happens if demand for my product is much higher than I expected and I can’t fill all of the customer orders?

**PA1-3**

Req. 1

You should take the position that an *independent* annual audit of the financial statements is an absolute must. This is the best way to ensure that the financial statements are complete, are free from bias, and conform with GAAP. You should be prepared to reject the partner’s uncle as the auditor because there is no evidence about his competence as an accountant or auditor. Also, he does not appear independent because he is related to the partner who prepares the financial statements, resulting in a potential conflict of interest. Hire an independent CPA.

Req. 2

You should recommend the selection of an independent CPA in public practice because the financial statements should be audited by a competent and independent professional who must follow prescribed accounting and auditing standards on a strictly independent basis. An audit by an uncle would not meet these requirements.

**PA1-4**

Req. 1 and 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factory rent | $3,200 | Product | MOH | Fixed |
| Company advertising | 1,000 | Period |  | Fixed |
| Wages paid to assembly workers | 30,000 | Product | DL | Variable |
| Depreciation for salespersons’ vehicles | 2,000 | Period |  | Fixed |
| Screws\* | 500 | Product | MOH | Variable |
| Utilities for factory | 900 | Product | MOH | Variable |
| Assembly supervisor salary | 3,500 | Product | MOH | Fixed |
| Sandpaper\* | 150 | Product | MOH | Variable |
| President’s salary | 6,000 | Period |  | Fixed |
| Plastic tubing | 4,200 | Product | DM | Variable |
| Paint\* | 250 | Product | MOH | Variable |
| Sales commissions | 1,200 | Period |  | Variable |
| Factory insurance | 1,000 | Product | MOH | Fixed |
| Depreciation on cutting machines | 2,000 | Product | MOH | Fixed |
| Wages paid to painters | 7,500 | Product | DL | Variable |

\*Assumes that screws, sandpaper, and paint are not worth the effort to trace to specific units and are treated as manufacturing overhead.

Req. 3.

1. Direct materials = $4,200
2. Direct labor = $30,000 + $7,500 = $37,500
3. Manufacturing overhead = $3,200 + $500 + $900 + $3,500 + $150 + $250 + $1,000 + $2,000 = $11,500
4. Prime cost = direct material + direct labor = $4,200 + 37,500 = $41,700
5. Conversion cost = direct labor + manufacturing overhead = $37,500 + $11,500 = $49,000
6. Total product cost = direct materials + direct labor + manufacturing overhead = $4,200 + $37,500 + $11,500 = $53,200
7. Total period cost = $1,000 + $2,000 + $6,000 + $1,200 = $10,200
8. Total variable cost =   
   $30,000 + $500 + $900 + $150 + $4,200 + $250 + $1,200 + $7,500 = $44,700
9. Total fixed cost =   
   $3,200 + $1,000 + $2,000 + $3,500 + $6,000 + $1,000 + $2,000 = $18,700

Req. 4

According to GAAP, product costs must be counted as inventory (raw materials, work in process, or finished goods) until the product is sold. Period expenses are expensed immediately and are never included in inventory. If the period costs were mistakenly classified as product costs AND Jiffy had significant amounts of inventory in the form of raw materials, work in process, or finished goods, then Jiffy’s inventory (assets) would be overstated on the balance sheet, while operating expenses would be understated on the income statement.

**ANSWERS TO PROBLEMS – SET B**

**PB1-1**

Req. 1

According to GAAP (financial reporting rules), all manufacturing costs must be treated as product costs and included in inventory until the product is sold. Non-manufacturing costs must be expensed immediately.

1. Product cost: All manufacturing related costs:
   1. Three types of manufacturing costs:
      1. Direct material: The major costs of materials that can be traced to the end product.
      2. Direct labor: The “hands on” labor that can be traced to the end product.
      3. Manufacturing overhead: All other costs incurred to manufacture the product besides direct material and direct labor.
   2. These costs flow through the following inventory accounts:
      1. Raw materials inventory: for materials purchased but not yet used in production.
      2. Work in Process inventory: includes all manufacturing costs that have been incurred on units that are not yet complete.
      3. Finished goods inventory: includes the total manufacturing costs of units that are completed, but not yet sold.
   3. Product costs will appear on the balance sheet as inventory (an asset) until the product is sold, at which point they will be reported on the income statement as Cost of Goods Sold.
2. Period costs: All non-manufacturing related costs.
   1. Generally classified as two types:
      1. General and administrative expenses (e.g., corporate expenses).
      2. Selling and distribution expenses (e.g., sales commissions, advertising, or shipping costs).
   2. These costs are expensed immediately and are never included on the balance sheet. They are immediately deducted as operating expenses on the income statement.

Req. 2

Students should be able to list at least five questions that may be asked during the presentation, along with the answer.

**PB1-2**

There are three basic functions of management. The three functions are interrelated, and some questions included in one phase may relate to another.

1. Planning (setting short and long-term objectives and identifying the resources needed to achieve them)

Examples of questions Maria must address in the planning stage include:

* Are there similar products on the market?
* How does my product compare to those products?
* How much would consumers be willing to pay for my product?
* How much cash will I need to launch my business?
* Will I borrow the money from the bank or invest my own savings?
* How many people will I need to hire?
* How much will I have to pay them?
* How many units do I think I can sell the first year and the second year?
* How much will it cost to produce the product?
* How many units will I have to sell to break even? How long will it take?
* How many units will I need to sell if I want to be making $200,000 in profit by year 3?
* Will I try to manufacture the product myself, or hire another company to do it for me?
* How will a price increase/decrease affect sales and profitability?
* How will I get the product into the hands of my customers?
* How much do I need to spend on marketing?

1. Implementing (taking action to implement the plan)

Examples of questions Maria must address in the implementation stage include:

* Will I supervise the production process myself, or hire someone else to do it?
* How much responsibility will I be able to delegate to my employees?
* How do I motivate my employees to work hard to meet production and sales goals?
* How do I deal with customer complaints?
* Should I fire an employee who is always late for work?

1. Controlling (making adjustments to the plan based on actual results)

Examples of questions Maria might have to address in the controlling stage include:

* What happens if sales are much lower than I expected?
* What happens if I run out of cash during the first year?
* What happens if the cost of raw materials increases significantly?
* What happens if demand for my product is much higher than I expected and I can’t fill all of the customer orders?

**PB1-3**

Req. 1

Unapproved refunds and voids can be used by dishonest cashiers to eliminate valid sales that have been made and paid for by customers. By eliminating the sales revenue, cashiers can then take the cash given by the customer without anyone knowing it. While the register-monitoring control does not completely prevent this from happening, it does make it possible to detect it on a timely basis. Today, most cash registers require cashiers to enter an employee identification number, so unusual “refund or void” activities can be linked to a particular employee, who can be questioned and/or monitored more closely.

Req. 2

The parties most directly affected by inventory theft in this case are Famous Footwear’s (1) managers and (2) employees, and Brown Shoe’s (3) investors, (4) creditors, and (5) customers.

Managers are likely to be paid, in part, based on the financial performance of each store. If inventory is being taken without full payment for the sale, the store’s gross profit (and net income) will be lower than it should be. This will adversely affect the managers’ pay.

Obviously, any dishonest employees who are detected will be harmed (fired, sued, jailed) by having committed the theft. Beyond them, though, other store employees will be harmed, particularly if the company’s head office has to close stores whose profits are significantly reduced as a result of inventory theft by dishonest employees.

Because Brown Shoe Company ultimately “owns” the profits of Famous Footwear, any theft by employees at Famous Footwear will adversely affect the financial results of Brown Shoe Company. Poor financial results could harm investors whose ownership share in Brown’s stock will likely fall in value. Similarly, poor financial results could cause Brown Shoe Company to violate loan covenants, which could lead to renegotiation of the company’s loans on less favorable terms, causing further reductions in the company’s income and stock price.

Brown’s creditors could be adversely affected if financial losses delay the company’s ability to repay its liabilities on a timely basis or, in the extreme case, prevent the company from repaying its liabilities at all.

Loyal customers could be adversely affected if the theft leads the company to increase its selling prices in efforts to generate greater revenues to offset the costs of inventory theft and remain sufficiently profitable.

**PB1-4**

Req. 1 and 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factory rent | $2,000 | Product | MOH | Fixed |
| Company advertising | 500 | Period |  | Fixed |
| Wages paid to assembly workers | 25,000 | Product | DL | Variable |
| Depreciation for salespersons’ vehicles | 1,000 | Period |  | Fixed |
| Screws\* | 250 | Product | MOH | Variable |
| Utilities for factory | 800 | Product | MOH | Variable |
| Production supervisors’ salary | 4,000 | Product | MOH | Fixed |
| Sandpaper\* | 150 | Product | MOH | Variable |
| President’s salary | 6,000 | Period |  | Fixed |
| Sheet metal | 7,500 | Product | DM | Variable |
| Paint\* | 750 | Product | MOH | Variable |
| Sales commissions | 1,700 | Period |  | Variable |
| Factory insurance | 2,000 | Product | MOH | Fixed |
| Depreciation on factory machinery | 5,000 | Product | MOH | Fixed |
| Wages paid to painters | 5,500 | Product | DL | Variable |

\*Assumes that screws, sandpaper, and paint are not worth the effort to trace to specific units and are treated as manufacturing overhead.

Req. 3

1. Direct materials = $7,500
2. Direct labor = $25,000 + $5,500 = $30,500
3. Manufacturing overhead = $2,000 + $250 + $800 + $4,000 + $150 + $750 + $2,000 + $5,000 = $14,950
4. Prime cost = direct materials + direct labor = $7,500 + $30,500 = $38,000
5. Conversion cost = direct labor + manufacturing overhead = $30,500 + $14,950 = $45,450
6. Total product cost = $7,500 + $30,500 + $14,950 = $52,950
7. Total period cost = $500 + $1,000 + $6,000 + $1,700 = $9,200
8. Total variable cost =   
   $25,000 + $250 + $800 + $150 + $7,500 + $750 + $1,700 + $5,500 = $41,650
9. Total fixed cost. =   
   ~~$500 +~~ $2,000 + $500 + $1,000 + $4,000 + $6,000 + $2,000 + $5,000 = $20,500

**PB1-4 (continued)**

Req. 4

According to GAAP, all manufacturing related cost must be treated as a product cost, while non-manufacturing costs are treated as a period expense. Thus, the depreciation on factory equipment is counted as manufacturing overhead, while the depreciation on the sales persons’ vehicles is treated as a period expense. For financial reporting purposes, all product costs are initially counted as inventory (raw materials, work in process, or finished goods) on the balance sheet. Once the product is sold, these costs are transferred to Cost of Goods Sold on the income statement. The period expenses are never reported as part of inventory, but rather are expensed on the income statement during the period incurred.

ANSWERS TO SKILLS DEVELOPMENT CASES

**S1-1**

The solution to this case will depend on the particular item that the student chooses to investigate. The primary purpose of this case is to get students to think more concretely about what is involved in manufacturing a product. Since most students at this level will have very limited work experience, and may never have been inside a manufacturing facility, this exercise will help make the definitions in the chapter more concrete. Tying it to an everyday item that they use will also allow them to visualize the end product and the different types of costs that go into making that product.

**S1-2**

The solution to this problem will depend on the company the student chooses to examine, but some common expectations are shown below:

Describing the physical changes is intended to get the student to think concretely about how automation will affect the company’s processes. For example, what type of machinery will be used, and how will it change other processes, such as the flow of the product or the type of work that will be performed.

Negative morale issues are likely to be encountered initially as some employees may be “replaced” with automation. In the long run, however, automation could enhance employee morale as it may allow employees to do different kinds of work that requires more skill, training, and motivation, which may also lead to lower employee turnover and higher morale.

In general, automation is likely to increase the skill level of the organization. It won’t necessarily lead to reduced labor costs overall, but will likely change the type of labor (from unskilled to skilled). This would result in a shift from direct labor cost (wages) to indirect labor costs (manufacturing overhead or administrative overhead).

Automation can either increase or decrease the quality of the end product, depending on the type of product or service the student selected. An automated process is likely to be more consistent than a manual process. But with automation you may lose some advantages of the human touch. For example, most would argue that a manual car wash is superior to a machine wash…. but the machine is likely to do things the same way, every time, which may lead to higher quality overall. The efficiency issue can also swing either way. Machines can often do things more quickly than humans, which can lead to increased efficiency. However, efficiency is a function of both inputs and output, and automation requires a significant up-front investment that cannot be reduced as easily as direct labor. This may mean that machines are idle, which will result in reduced efficiency.

**S1-2 (continued)**

Automation will likely affect all of the manufacturing costs. Different types of material inputs may be required in an automated process versus a manual process (again, think of a manual car wash vs. an automatic one; they will require different types of detergents, etc.). Generally speaking, automation will cause a shift from direct “hands-on” labor to indirect labor, such as supervision, maintenance, engineers, etc. These indirect labor costs are counted as overhead rather than direct labor. Finally, the cost of the machinery and equipment is likely to significantly increase the overhead costs.

Automation usually results in a shift from variable costs to fixed costs. Instead of hiring direct labor, which will vary directly with production needs, automation requires a significant up-front investment that will be incurred regardless of future production activity (i.e., fixed costs).

Automation may either increase or decrease the price you pay for the product, depending on whether it increases or decreases the quality of the product, the cost structure of the company, and the efficiency of the production process. In general, one would expect that automation will decrease the cost of the final product and that some of this savings would be passed on to end customers.

Again, this will depend on a variety of factors, many of which are discussed above. Perhaps most important is whether the demand for the product is sufficient to compensate for the increased “fixed” cost of automation. If the demand is not high enough, the company may have been better off with a manual process, which may have lower fixed costs, but higher variable costs.

**S1-3**

1. Students should be able to find many examples of service, merchandising, or manufacturing firms. They should use the description of the company to support their categorization of the firms as primarily service, merchandising, or manufacturing in nature. However, students may find that the distinction is not quite as clear-cut as the textbook makes it appear. Many service companies will provide products for resale. Manufacturing firms often have merchandising outlets as well. Almost all companies must excel in customer service in order to be successful.
2. In terms of the financial statements, students should be looking to cost of goods sold or cost of sales on the income statement, and the inventory accounts on the balance sheet, to differentiate between service, merchandising, and manufacturing companies.

**S1-4**

Answers to this case will vary, but should reinforce to students the elements of the triple bottom line and give them a chance to find out if companies have really changed the way they do business in order to become more sustainable.

**S1-5**

1. Utility expenses typically behave as a mixed cost, which includes both a fixed and variable component. The fixed portion is the minimum utility expenses that will be incurred even if the business is not operating for a period of time. The variable portion increases with increases in activity, such as the power needed to run equipment.
2. Managers at CPK used the energy reports to plan for what their energy costs should be for each location based on its size and geographic location. They implemented several energy-saving techniques. They then continued to monitor or control their energy expenses to determine whether they were achieving their energy-saving objectives. As the CPK executive noted: "These reports made it possible for our company to understand where we are and navigate where we can go. We were able to establish a performance benchmark, set goals, and report very specifically on our progress.”
3. The energy initiative helped CPK achieve its sustainability goals by affecting both the economic and environmental components of the triple bottom line. In addition to reducing expenses and thus boosting profitability (economic effect), it also reduced the company's consumption of energy (an environmental effect).
4. The energy initiative used descriptive analytics by providing a summary of energy expenses for various location types, based on their size and geographic region. This allowed managers to see which locations were using energy efficiently versus those that needed improvement. Predictive analytics could be used to predict future energy needs based on factors such as size (square footage), operating hours, average temperature, etc. Prescriptive analytics extends beyond just interpreting the data to make specific recommendations for how managers could reduce energy expenses. For example, ensuring that all equipment is maintained on a routine basis and adjusting temperature set-points to keep a consistent temperature. Consulting firms such as ENGIE specialize in prescriptive analytics, which goes beyond simply describing and predicting data to helping managers making recommendations about how to put the insight provided by the data into action.