Standard Cost and Balance Scorecard

Managerial Accounting
Fifth Edition
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study objectives

1. Distinguish between a standard and a budget.
2. Identify the advantages of standard costs.
3. Describe how companies set standards.
4. State the formulas for determining direct materials and direct labor variances.
5. State the formula for determining the total manufacturing overhead variance.
6. Discuss the reporting of variances.
7. Prepare an income statement for management under a standard costing system.
8. Describe the balanced scorecard approach to performance evaluation.
# Standard Costs and Balanced Scorecard

## The Need for Standards
- Standards vs. budgets
- Why standard costs?

## Setting Standard Costs
- Ideal vs. normal
- Case study

## Analyzing and Reporting Variances from Standards
- Direct materials variances
- Direct labor variances
- Manufacturing overhead variances
- Reporting variances
- Statement presentation

## Balanced Scorecard
- Financial perspective
- Customer perspective
- Internal process perspective
- Learning and growth perspective
Distinguishing between Standards and Budgets

Both standards and budgets are predetermined costs, and both contribute to management planning and control.

There is a difference:

- A standard is a unit amount.
- A budget is a total amount.

SO 1 Distinguish between a standard and a budget.
The Need for Standards

Advantages of Standard Costs

- Facilitate management planning
- Promote greater economy by making employees more “cost-conscious”
- Useful in setting selling prices
- Contribute to management control by providing basis for evaluation of cost control
- Useful in highlighting variances in management by exception
- Simplify costing of inventories and reduce clerical costs

SO 2 Identify the advantages of standard costs.
Setting standard costs requires input from all persons who have responsibility for costs and quantities.

Standards should change whenever managers determine that the existing standard is not a good measure of performance.
Setting Standard Costs—a Difficult Task

Ideal versus Normal Standards

Companies set standards at one of two levels:

- **Ideal standards** represent optimum levels of performance under perfect operating conditions.

- **Normal standards** represent efficient levels of performance that are attainable under expected operating conditions.

Properly set, normal standards should be **rigorous but attainable**.
Setting Standard Costs—a Difficult Task

Question

Most companies that use standards set them at a(n):

a. optimum level.
b. ideal level.
c. normal level.
d. practical level.
Accounting Across the Organization

How Do Standards Help a Business?

Recently a number of organizations, including corporations, consultants, and governmental agencies, agreed to share information regarding performance standards in an effort to create a standard set of measures for thousands of business processes. The group, referred to as the Open Standards Benchmarking Collaborative, includes IBM, Procter and Gamble, the U.S. Navy, and the World Bank. Companies that are interested in participating can go to the group’s website and enter their information.


How will the creation of such standards help a business or organization?
Setting Standard Costs—a Difficult Task

A Case Study

To establish the standard cost of producing a product, it is necessary to establish standards for each manufacturing cost element—

- direct materials,
- direct labor, and
- manufacturing overhead.

The standard for each element is derived from the standard price to be paid and the standard quantity to be used.
Direct Materials

The **direct materials price standard** is the cost per unit of direct materials that should be incurred.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price, net of discounts</td>
<td>$2.70</td>
</tr>
<tr>
<td>Freight</td>
<td>0.20</td>
</tr>
<tr>
<td>Receiving and handling</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Standard direct materials price per pound</strong></td>
<td><strong>$3.00</strong></td>
</tr>
</tbody>
</table>
Setting Standard Costs—a Difficult Task

Direct Materials

The direct materials quantity standard is the quantity of direct materials that should be used per unit of finished goods.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required materials</td>
<td>3.5</td>
</tr>
<tr>
<td>Allowance for waste</td>
<td>0.4</td>
</tr>
<tr>
<td>Allowance for spoilage</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Standard direct materials quantity per unit</strong></td>
<td><strong>4.0</strong></td>
</tr>
</tbody>
</table>

The standard direct materials cost is $12.00 ($3.00 x 4.0 pounds).

SO 3 Describe how companies set standards.
Setting Standard Costs—a Difficult Task

Review Question

The direct materials price standard should include an amount for all of the following except:

a. receiving costs.
b. storing costs.
c. handling costs.
d. normal spoilage costs.

SO 3 Describe how companies set standards.
**Direct Labor**

The **direct labor price standard** is the rate per hour that should be incurred for direct labor.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly wage rate</td>
<td>$ 7.50</td>
</tr>
<tr>
<td>COLA</td>
<td>0.25</td>
</tr>
<tr>
<td>Payroll taxes</td>
<td>0.75</td>
</tr>
<tr>
<td>Fringe benefits</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Standard direct labor rate per hour</strong></td>
<td><strong>$10.00</strong></td>
</tr>
</tbody>
</table>
Setting Standard Costs—a Difficult Task

Direct Labor

The **direct labor quantity standard** is the time that should be required to make one unit of the product.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual production time</td>
<td>1.5</td>
</tr>
<tr>
<td>Rest periods and cleanup</td>
<td>0.2</td>
</tr>
<tr>
<td>Setup and downtime</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Standard direct labor hours per unit</strong></td>
<td><strong>2.0</strong></td>
</tr>
</tbody>
</table>

The standard direct labor cost is $20 ($10.00 x 2.0 hours).

**SO 3** Describe how companies set standards.
Setting Standard Costs—a Difficult Task

Manufacturing Overhead

For manufacturing overhead, companies use a **standard predetermined overhead rate** in setting the standard.

This overhead rate is determined by dividing budgeted overhead costs by an expected standard activity index, such as standard direct labor hours or standard machine hours.
Manufacturing Overhead

The company expects to produce 13,200 gallons during the year at normal capacity. It takes 2 direct labor hours for each gallon.

<table>
<thead>
<tr>
<th>Budgeted Overhead Costs</th>
<th>Amount</th>
<th>÷</th>
<th>Standard Direct Labor Hours</th>
<th>=</th>
<th>Overhead Rate per Direct Labor Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>$ 79,200</td>
<td>26,400</td>
<td></td>
<td>$3.00</td>
<td></td>
</tr>
<tr>
<td>Fixed</td>
<td>52,800</td>
<td>26,400</td>
<td></td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$132,000</td>
<td>26,400</td>
<td></td>
<td>$5.00</td>
<td></td>
</tr>
</tbody>
</table>

Standard manufacturing overhead rate per gallon is $10 ($5 x 2 hours).

SO 3 Describe how companies set standards.
Total Standard Cost Per Unit

The total standard cost per unit is the sum of the standard costs of direct materials, direct labor, and manufacturing overhead.

<table>
<thead>
<tr>
<th>Manufacturing Cost Elements</th>
<th>Standard Quantity</th>
<th>Standard Price</th>
<th>Standard Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>4 pounds</td>
<td>$3.00</td>
<td>$12.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>2 hours</td>
<td>$10.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>2 hours</td>
<td>$5.00</td>
<td>$10.00</td>
</tr>
</tbody>
</table>

The total standard cost per gallon is $42.

SO 3 Describe how companies set standards.
Ridette Inc. accumulated the following standard cost data concerning product Cty31.

- Materials per unit: 1.5 pounds at $4 per pound.
- Labor per unit: 0.25 hours at $13 per hour.
- Manufacturing overhead: Predetermined rate is 120% of direct labor cost.

Compute the standard cost of one unit of product Cty31.

<table>
<thead>
<tr>
<th>Manufacturing Cost Element</th>
<th>Standard Quantity</th>
<th>Standard Price</th>
<th>Standard Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>1.5 pounds</td>
<td>$4.00</td>
<td>$6.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.25 hours</td>
<td>$13.00</td>
<td>3.25</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>120% of direct labor cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Management Insight

How Can We Make Susan’s Chili Profitable?

Setting standards can be difficult. Consider Susan’s Chili Factory, which manufactures and sells chili. The cost of manufacturing Susan’s chili consists of the costs of raw materials, labor to convert the basic ingredients to chili, and overhead. We will use materials cost as an example. Managers need to develop three standards: (1) What should be the formula (mix) of ingredients for one gallon of chili? (2) What should be the normal wastage (or shrinkage) for the individual ingredients? (3) What should be the standard cost for the individual ingredients that go into the chili?

Susan’s Chili Factory also illustrates how managers can use standard costs in controlling costs. Suppose that summer droughts have reduced crop yields. As a result, prices have doubled for beans, onions, and peppers. In this case, actual costs will be significantly higher than standard costs, which will cause management to evaluate the situation. Similarly, assume that poor maintenance caused the onion-dicing blades to become dull. As a result, usage of onions to make a gallon of chili tripled. Because this deviation is quickly highlighted through standard costs, managers can take corrective action promptly.

Source: Adapted from David R. Beran, “Cost Reduction Through Control Reporting,” Management Accounting, April 1982, pp. 29–33.

How might management use this raw material cost information?
One of the major management uses of standard costs is to identify variances from standards. **Variances** are the differences between total actual costs and total standard costs.
Analyzing and Reporting Variances

Question

A variance is favorable if actual costs are:

a. less than budgeted costs.
b. less than standard costs.
c. greater than budgeted costs.
d. greater than standard costs
When actual costs exceed standard costs, the variance is **unfavorable**.

When actual costs are less than standard costs, the variance is **favorable**.

To interpret properly the significance of a variance, you must analyze it to determine the underlying factors. Analyzing variances begins by determining the cost elements that comprise the variance.
Illustration: Assume that in producing 1,000 gallons of Weed-O in the month of June, Xonic, Inc. incurred the following costs.

<table>
<thead>
<tr>
<th>Costs</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$13,020</td>
</tr>
<tr>
<td>Direct labor</td>
<td>20,580</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>6,500</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>4,400</td>
</tr>
<tr>
<td><strong>Total actual costs</strong></td>
<td><strong>$44,500</strong></td>
</tr>
</tbody>
</table>

The total standard cost of Weed-O is $42,000 (1,000 gallons x $42). Thus, the total variance is $2,500.

**SO 4** State the formulas for determining direct materials and direct labor variances.
Analyzing and Reporting Variances

Direct Materials Variances

In completing the order for 1,000 gallons of Weed-O, Xonic used 4,200 pounds of direct materials. These were purchased at a cost of $3.10 per unit. Standard price is $3.

Actual Quantity x Actual Price = Total Materials Variance

\[ \text{Actual Quantity} \times \text{Actual Price} - \text{Standard Quantity} \times \text{Standard Price} = \text{Total Materials Variance} \]

\[ (AQ) \times (AP) - (SQ) \times (SP) = \text{(TMV)} \]

Illustration 11-10

SO 4 State the formulas for determining direct materials and direct labor variances.
Direct Materials Variances

Next, the company analyzes the total variance to determine the amount attributable to price (costs) and to quantity (use). The **materials price variance** is computed from the following formula.

\[
\text{Materials Price Variance (MPV)} = (AQ \times AP) - (AQ \times SP)
\]

Where:
- \(AQ\) = Actual Quantity
- \(AP\) = Actual Price
- \(SP\) = Standard Price

Illustration 11-11

**SO 4** State the formulas for determining direct materials and direct labor variances.
Direct Materials Variances

The **materials quantity variance** is determined from the following formula.

\[
\text{Materials Quantity Variance (MQV)} = (\text{Actual Quantity} \times \text{Standard Price}) - (\text{Standard Quantity} \times \text{Standard Price})
\]

Illustration 11-12

Companies sometimes use a matrix to analyze a variance.

Solution on notes page

SO 4 State the formulas for determining direct materials and direct labor variances.
**Matrix for Direct Materials Variances**

1. **Actual Quantity** × **Actual Price**
   \[ (AQ) \times (AP) \]
   \[ 4,200 \times 3.10 = 13,020 \]

2. **Actual Quantity** × **Standard Price**
   \[ (AQ) \times (SP) \]
   \[ 4,200 \times 3.00 = 12,600 \]

3. **Standard Quantity** × **Standard Price**
   \[ (SQ) \times (SP) \]
   \[ 4,000 \times 3.00 = 12,000 \]

**Price Variance**
\[ 1 - 2 \]
\[ 13,020 - 12,600 = 420 \text{ U} \]

**Quantity Variance**
\[ 2 - 3 \]
\[ 12,600 - 12,000 = 600 \text{ U} \]

**Total Variance**
\[ 1 - 3 \]
\[ 13,020 - 12,000 = 1,020 \text{ U} \]

**Illustration 11-14**

**SO 4** State the formulas for determining direct materials and direct labor variances.
Causes of Material Variances

**Materials price variance** - factors that affect the price paid for raw materials include the availability of quantity and cash discounts, the quality of the materials requested, and the delivery method used. To the extent that these factors are considered in setting the price standard, the *purchasing department* is responsible.

**Materials quantity variance** - if the variance is due to inexperienced workers, faulty machinery, or carelessness, the *production department* is responsible.

SO 4 State the formulas for determining direct materials and direct labor variances.
The standard cost of Product XX includes two units of direct materials at $8.00 per unit. During July, the company buys 22,000 units of direct materials at $7.50 and uses those materials to produce 10,000 units. Compute the total, price, and quantity variances for materials.

<table>
<thead>
<tr>
<th>Standard quantity</th>
<th>Substituting amounts into the formulas, the variances are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total materials variance =</td>
<td>$8.00 \times 10,000 - $7.50 \times 22,000 = $1,000</td>
</tr>
<tr>
<td>Materials price variance =</td>
<td>$8.00 - $7.50 = $0.50</td>
</tr>
<tr>
<td>Materials quantity variance =</td>
<td>$8.00 \times 10,000 - $7.50 \times 10,000 = $5,000</td>
</tr>
</tbody>
</table>

SO 4 State the formulas for determining direct materials and direct labor variances.
Analyzing and Reporting Variances

Direct Labor Variances

In completing the Weed-O order, Xonic, Inc. incurred 2,100 direct labor hours at an average hourly rate of $9.80. The standard hours allowed for the units produced were 2,000 hours (1,000 gallons x 2 hours). The standard labor rate was $10 per hour. The total labor variance is computed as follows.

\[
\text{Total Labor Variance (TLV)} = (\text{Actual Hours (AH)} \times \text{Actual Rate (AR)}) - (\text{Standard Hours (SH)} \times \text{Standard Rate (SR)})
\]

Illustration 11-15

SO 4 State the formulas for determining direct materials and direct labor variances.
Analyzing and Reporting Variances

Direct Labor Variances

Next, the company analyzes the total variance to determine the amount attributable to price (costs) and to quantity (use). The labor price variance is computed from the following formula.

\[
\text{Actual Hours} \times \text{Actual Rate} - \text{Actual Hours} \times \text{Standard Rate} = \text{Labor Price Variance (LPV)}
\]

Illustration 11-16
Analyzing and Reporting Variances

Direct Labor Variances

The labor quantity variance is determined from the following formula.

\[
\text{Labor Quantity Variance (LQV)} = \text{Actual Hours} \times \text{Standard Rate} - \text{Standard Hours} \times \text{Standard Rate}.
\]

Companies sometimes use a matrix to analyze a variance.
**Matrix for Direct Labor Variances**

<table>
<thead>
<tr>
<th>1</th>
<th>Actual Hours × Actual Rate (AH) × (AR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,100 x $9.80 = $20,580</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Actual Hours × Standard Rate (AH) × (SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,100 x $10.00 = $21,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Standard Hours × Standard Rate (SH) × (SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,000 x $10.00 = $20,000</td>
</tr>
</tbody>
</table>

**Price Variance**

\[ 1 - 2 \]

\[ $20,580 - $21,000 = $420 \text{ F} \]

**Quantity Variance**

\[ 2 - 3 \]

\[ $21,000 - $20,000 = $1,000 \text{ U} \]

**Total Variance**

\[ 1 - 3 \]

\[ $20,580 - $20,000 = $580 \text{ U} \]

Illustration 11-19

SO 4 State the formulas for determining direct materials and direct labor variances.
Analyzing and Reporting Variances

Causes of Labor Variances

**Labor price variance** – usually results from two factors: (1) paying workers **different wages than expected**, and (2) **misallocation of workers**. The manager who authorized the wage increase is responsible for the higher wages. The production department generally is responsible for labor price variances resulting from misallocation of the workforce.

**Labor quantity variances** – relates to the **efficiency of workers**. The cause of a quantity variance generally can be traced to the production department.

SO 4 State the formulas for determining direct materials and direct labor variances.
Manufacturing Overhead Variances

Manufacturing overhead variances involves total overhead variance, overhead controllable variance, and overhead volume variance.

Manufacturing overhead costs are applied to work in process on the basis of the standard hours allowed for the work done.
Total Overhead Variance

The total overhead variance is the difference between actual overhead costs and overhead costs applied to work done. The computation of the actual overhead is comprised of a variable and a fixed component.

<table>
<thead>
<tr>
<th>Variable overhead</th>
<th>$ 6,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed overhead</td>
<td>4,400</td>
</tr>
<tr>
<td><strong>Total actual overhead</strong></td>
<td><strong>$10,900</strong></td>
</tr>
</tbody>
</table>

Illustration 11-20

The predetermined rate for Weed-O is $5, comprised of a variable overhead rate of $3 and a fixed rate of $2.

SO 5 State the formula for determining the total manufacturing overhead variance.
**Analyzing and Reporting Variances**

**Total Overhead Variance**

The formula for the total overhead variance and the calculation for Xonic, Inc. for the month of June.

\[
\text{Actual Overhead} - \text{Overhead Applied*} = \text{Total Overhead Variance}
\]

\[
\begin{align*}
\text{Actual Overhead} & = 10,900 \\
\text{Overhead Applied*} & = 10,000
\end{align*}
\]

\[
\text{Total Overhead Variance} = 900 \text{ U}
\]

*Based on standard hours allowed.

**SO 5** State the formula for determining the total manufacturing overhead variance.
Analyzing and Reporting Variances

Total Overhead Variance

The overhead variance is generally analyzed through a price variance and a quantity variance.

Overhead controllable variance (price variance) shows whether overhead costs are effectively controlled.

Overhead volume variance (quantity variance) relates to whether fixed costs were under- or over-applied during the year.
The standard cost of Product YY includes 3 hours of direct labor at $12.00 per hour. The predetermined overhead rate is $20.00 per direct labor hour. During July, the company incurred 3,500 hours of direct labor at an average rate of $12.40 per hour and $71,300 of manufacturing overhead costs. It produced 1,200 units. (a) Compute the total, price, and quantity variances for labor. (b) Compute the total overhead variance.

Substituting amounts into the formulas, the variances are:

Total labor variance =  
Labor price variance =  
Labor quantity variance =  
Total overhead variance =  

*3,600 hours × $20.00
Reporting Variances

- All variances should be reported to appropriate levels of management as soon as possible.
- The form, content, and frequency of variance reports vary considerably among companies.
- Facilitate the principle of “management by exception.”
- Top management normally looks for significant variances.

SO 6 Discuss the reporting of variances.
## Reporting Variances

Materials price variance report for Xonic, Inc., with the materials for the Weed-O order listed first.

### XONIC, INC.
**Variance Report – Purchasing Department**
**For Week Ended June 8, 2011**

<table>
<thead>
<tr>
<th>Type of Materials</th>
<th>Quantity Purchased</th>
<th>Actual Price</th>
<th>Standard Price</th>
<th>Price Variance</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X100</td>
<td>4,200 lbs.</td>
<td>$3.10</td>
<td>$3.00</td>
<td>$420 U</td>
<td>Rush order</td>
</tr>
<tr>
<td>X142</td>
<td>1,200 units</td>
<td>2.75</td>
<td>2.80</td>
<td>60 F</td>
<td>Quantity discount</td>
</tr>
<tr>
<td>A85</td>
<td>600 doz.</td>
<td>5.20</td>
<td>5.10</td>
<td>60 U</td>
<td>Regular supplier on strike</td>
</tr>
</tbody>
</table>

**Total price variance**

![Image](image.png)

**Illustration 11-22**

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**SO 6** Discuss the reporting of variances.
Statement Presentation of Variances

In income statements prepared for management under a standard cost accounting system, cost of goods sold is stated at standard cost and the variances are disclosed separately.

XONIC, INC.
Income Statement
For the Month Ended June 30, 2011

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$60,000</td>
</tr>
<tr>
<td>Cost of goods sold (at standard)</td>
<td>42,000</td>
</tr>
<tr>
<td>Gross profit (at standard)</td>
<td>18,000</td>
</tr>
<tr>
<td><strong>Variances</strong></td>
<td></td>
</tr>
<tr>
<td>Materials price</td>
<td>$ 420</td>
</tr>
<tr>
<td>Materials quantity</td>
<td>600</td>
</tr>
<tr>
<td>Labor price</td>
<td>(420)</td>
</tr>
<tr>
<td>Labor quantity</td>
<td>1,000</td>
</tr>
<tr>
<td>Overhead</td>
<td>900</td>
</tr>
<tr>
<td><strong>Total variance unfavorable</strong></td>
<td>2,500</td>
</tr>
<tr>
<td>Gross profit (actual)</td>
<td>15,500</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td>3,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$12,500</td>
</tr>
</tbody>
</table>

SO 7 Prepare an income statement for management under a standard costing system.
Review Question

Which of the following is incorrect about variance reports?

a. They facilitate “management by exception”.

b. They should only be sent to the top level of management.

c. They should be prepared as soon as possible.

d. They may vary in form, content, and frequency among companies.
The balanced scorecard incorporates financial and nonfinancial measures in an integrated system that links performance measurement and a company’s strategic goals.

The balanced scorecard evaluates company performance from a series of “perspectives.” The four most commonly employed perspectives are as follows.

- Financial
- Customer
- Internal Process
- Learning and Growth

SO 8 Describe the balanced scorecard approach to performance evaluation.
Review Question

Which of the following would not be an objective used in the customer perspective of the balanced scorecard approach?

a. Percentage of customers who would recommend product to a friend.
b. Customer retention.
c. Brand recognition.
d. Earning per share.
In summary, the balanced scorecard does the following:

1. Employs both financial and nonfinancial measures.

2. Creates linkages so that high-level corporate goals can be communicated all the way down to the shop floor.

3. Provides measurable objectives for such nonfinancial measures as product quality, rather than vague statements such as “We would like to improve quality.”

4. Integrates all of the company’s goals into a single performance measurement system, so that an inappropriate amount of weight will not be placed on any single goal.

SO 8 Describe the balanced scorecard approach to performance evaluation.
Indicate which of the four perspectives in the balanced scorecard is most likely associated with the objectives that follow.

1. Percentage of repeat customers.  
2. Number of suggestions for improvement from employees.  
3. Contribution margin.  
4. Market share.  
5. Number of cross-trained employees.  
6. Amount of setup time.

- Financial perspective
- Customer perspective
- Internal process perspective
- Learning and growth perspective
Service Company Insight

It May Be Time to Fly United Again

Many of the benefits of a balanced scorecard approach are evident in the improved operations at United Airlines. At the time it filed for bankruptcy in 2002, United had a reputation for some of the worst service in the airline business. But when Glenn Tilton took over as United’s Chief Executive Officer in September 2002, he recognized that things had to change.

One thing he did was to implement an incentive program that allows all of United’s 63,000 employees to earn a bonus of 2.5% or more of their wages if the company “exceeds its goals for on-time flight departures and for customer intent to fly United again.” Since instituting this program the company’s on-time departures are among the best, its customer complaints have been reduced considerably, and its number of customers who say that they would fly United again is at its highest level ever. While none of these things guarantees that United will survive, these improvements certainly increase its chances.


Which of the perspectives of a balanced scorecard were the focus of United’s CEO?
Medical costs for a family of four hit $13,383 in 2006, a 9.6% increase over 2005. Of this amount, the employer typically pays about $8,363, and the employee pays about $5,020. Increases have averaged about 10% per year in recent years.

During the 1990s many healthcare facilities provided bonuses to doctors based on cost-based financial incentives. By the end of the 1990s critics began to question this approach because they felt it created perverse incentives for doctors. If a doctor is under pressure to reduce costs, he or she may feel compelled to not provide necessary care.
Some Facts

- Two reports, *To Err Is Human* in 1999 and *Crossing the Quality Chasm* in 2001, called attention to quality and patient-safety shortcomings. As a result, the new emphasis is to align compensation policies with quality improvement.

- Some health plans have adopted compensation systems that attempt to tie pay to performance. These systems offer higher pay for doctors who meet specific goals, such as preventive care, patient satisfaction, acquisition of information technology, and cost containment. In 2004, major California health plans paid physician organizations about $40 million in performance-based bonuses.
As the following graph shows, the United States spends a huge amount on health care compared to other countries. Note that we spend more on a per person basis, and as a percentage of our gross domestic product (GDP) than every other listed country. This fact makes it even more frustrating that more than 40 million Americans have no health coverage, and that on many measures of healthcare quality, America falls short.

Eventually we all need to see a doctor. Therefore, we all have a vested interest in the quality of medical care. As medical costs have soared in recent years, many approaches have been tried to keep costs down. A simmering debate has centered on a very basic question: To what extent should accountants, through financial measures, influence the type of medical care that you receive? Suppose that your local medical facility is in danger of closing because it has been losing money. Should the facility put in place incentives that provide bonuses to doctors if they meet certain standard-cost targets for the cost of treating specific ailments?

**YES:** If the facility is in danger of closing, then someone should take steps to change the medical practices to reduce costs.
Eventually we all need to see a doctor. Therefore, we all have a vested interest in the quality of medical care. As medical costs have soared in recent years, many approaches have been tried to keep costs down. A simmering debate has centered on a very basic question: To what extent should accountants, through financial measures, influence the type of medical care that you receive? Suppose that your local medical facility is in danger of closing because it has been losing money. Should the facility put in place incentives that provide bonuses to doctors if they meet certain standard-cost targets for the cost of treating specific ailments?

**NO:** I don’t want an accountant deciding the right medical treatment for me. My family and I deserve the best medical care.
A **standard cost accounting system** is a double-entry system of accounting. Companies may use a standard cost system with either

- job order or
- process costing.

The system is based on two important assumptions:

1. Variances from standards are recognized at the earliest opportunity.
2. The Work in Process account is maintained exclusively on the basis of standard costs.

**SO 9** Identify the features of a standard cost accounting system.
SO 9 Identify the features of a standard cost accounting system.

Illustration: 1. Purchase raw materials on account for $13,020 when the standard cost is $12,600.

\[
\begin{align*}
\text{Raw materials inventory} & \quad 12,600 \\
\text{Materials price variance} & \quad 420 \\
\text{Accounts payable} & \quad 13,020
\end{align*}
\]

2. Incur direct labor costs of $20,580 when the standard labor cost is $21,000.

\[
\begin{align*}
\text{Factory labor} & \quad 21,000 \\
\text{Labor price variance} & \quad 420 \\
\text{Wages payable} & \quad 20,580
\end{align*}
\]
3. Incur actual manufacturing overhead costs of $10,900.

   Manufacturing overhead          10,900
     Accounts payable/Cash/Acc. Deprec.  10,900

4. Issue raw materials for production at a cost of $12,600 when the standard cost is $12,000.

   Work in process inventory       12,000
     Materials quantity variance    600
     Raw materials inventory       12,600

SO 9 Identify the features of a standard cost accounting system.
5. Assign factory labor to production at a cost of $21,000 when standard cost is $20,000.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process inventory</td>
<td>20,000</td>
</tr>
<tr>
<td>Labor price variance</td>
<td>1,000</td>
</tr>
<tr>
<td>Factory labor</td>
<td>21,000</td>
</tr>
</tbody>
</table>

6. Applying manufacturing overhead to production $10,000.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process inventory</td>
<td>10,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>10,000</td>
</tr>
</tbody>
</table>

SO 9 Identify the features of a standard cost accounting system.
7. Transfer completed work to finished goods $42,000.

- Finished goods inventory 42,000
- Work in process inventory 42,000

8. The 1,000 gallons of Weed-O are sold for $60,000.

- Accounts receivable 60,000
- Cost of goods sold 42,000
  - Sales 60,000
  - Finished goods inventory 42,000
9. Recognize unfavorable total overhead variance:

<table>
<thead>
<tr>
<th>Overhead variance</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing overhead</td>
<td>900</td>
</tr>
</tbody>
</table>
Appendix 11A

Illustration 11A-1  
Cost accounts with variances

### Raw Materials Inventory

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>12,600</td>
</tr>
<tr>
<td>(4)</td>
<td>12,600</td>
</tr>
</tbody>
</table>

### Materials Price Variance

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>420</td>
</tr>
</tbody>
</table>

### Work in Process Inventory

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>(4)</td>
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<tr>
<td>(5)</td>
<td>20,000</td>
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<tr>
<td>(6)</td>
<td>10,000</td>
</tr>
<tr>
<td>(7)</td>
<td>42,000</td>
</tr>
</tbody>
</table>

### Factory Labor

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>(2)</td>
<td>21,000</td>
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<tr>
<td>(5)</td>
<td>21,000</td>
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</tbody>
</table>

### Materials Quantity Variance

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>(4)</td>
<td>600</td>
</tr>
</tbody>
</table>

### Finished Goods Inventory

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(7)</td>
<td>42,000</td>
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<tr>
<td>(8)</td>
<td>42,000</td>
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</tbody>
</table>

### Manufacturing Overhead

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)</td>
<td>10,900</td>
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<tr>
<td>(6)</td>
<td>10,000</td>
</tr>
<tr>
<td>(9)</td>
<td>900</td>
</tr>
</tbody>
</table>

### Labor Price Variance

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>420</td>
</tr>
</tbody>
</table>

### Cost of Goods Sold

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(8)</td>
<td>42,000</td>
</tr>
</tbody>
</table>

### Labor Quantity Variance

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>(5)</td>
<td>1,000</td>
</tr>
</tbody>
</table>

### Overhead Variance

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(9)</td>
<td>900</td>
</tr>
</tbody>
</table>

Standard Cost Accounting System
Total Overhead Variance

The **overhead variance** is generally analyzed through a price variance and a quantity variance.

**Overhead controllable variance** *(price variance)* shows whether overhead costs are effectively controlled.

**Overhead volume variance** *(quantity variance)* relates to whether fixed costs were under- or over-applied during the year.

*SO 10 Compute overhead controllable and volume variance.*
Overhead Controllable Variance

The overhead controllable variance shows whether overhead costs are effectively controlled. To compute this variance, the company compares actual overhead costs incurred with budgeted costs for the standard hours allowed. The budgeted costs are determined from a flexible manufacturing overhead budget.
Overhead Controllable Variance

For Xonic the budget formula for manufacturing overhead is variable manufacturing overhead cost of $3 per hour of labor plus fixed manufacturing overhead costs of $4,400.

<table>
<thead>
<tr>
<th>Activity Index</th>
<th>1,800</th>
<th>2,000</th>
<th>2,200</th>
<th>2,400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard direct labor hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect materials</td>
<td>$1,800</td>
<td>$ 2,000</td>
<td>$ 2,200</td>
<td>$ 2,400</td>
</tr>
<tr>
<td>Indirect labor</td>
<td>2,700</td>
<td>3,000</td>
<td>3,300</td>
<td>3,600</td>
</tr>
<tr>
<td>Utilities</td>
<td>900</td>
<td>1,000</td>
<td>1,100</td>
<td>1,200</td>
</tr>
<tr>
<td>Total variable costs</td>
<td>5,400</td>
<td>6,000</td>
<td>6,600</td>
<td>7,200</td>
</tr>
<tr>
<td>Fixed costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervision</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Depreciation</td>
<td>1,400</td>
<td>1,400</td>
<td>1,400</td>
<td>1,400</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>4,400</td>
<td>4,400</td>
<td>4,400</td>
<td>4,400</td>
</tr>
<tr>
<td>Total costs</td>
<td>$9,800</td>
<td>$10,400</td>
<td>$11,000</td>
<td>$11,600</td>
</tr>
</tbody>
</table>

SO 10 Compute overhead controllable and volume variance.
Overhead Controllable Variance

Illustration 11B-2 shows the formula for the overhead controllable variance and the calculation for Xonic, Inc.

<table>
<thead>
<tr>
<th>Actual Overhead</th>
<th>Overhead Budgeted*</th>
<th>Overhead Controllable Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,900 ($6,500 + $4,400)</td>
<td>$10,400 ($6,000 + $4,400)</td>
<td>$500 U</td>
</tr>
</tbody>
</table>

*Based on standard hours allowed.

SO 10  Compute overhead controllable and volume variance.
Overhead Volume Variance

Difference between normal capacity hours and standard hours allowed times the fixed overhead rate.

\[
\text{Fixed Overhead Rate} \times \left( \frac{\text{Normal Capacity Hours}}{-} - \frac{\text{Standard Hours Allowed}}{\text{}} \right) = \text{Overhead Volume Variance}
\]

SO 10 Compute overhead controllable and volume variance.
Illustration: Xonic Inc. budgeted fixed overhead cost for the year of $52,800. At normal capacity, 26,400 standard direct labor hours are required. Xonic produced 1,000 units of Weed-O in June. The standard hours allowed for the 1,000 gallons produced in June is 2,000 (1,000 gallons x 2 hours). For Xonic, standard direct labor hours for June at normal capacity is 2,200 (26,400 annual hours / 12 months). The computation of the overhead volume variance in this case is as follows.

\[
\text{Overhead Volume Variance} = \text{Fixed Overhead Rate} \times \left( \frac{\text{Normal Capacity} - \text{Standard Hours Allowed}}{\text{Hours}} \right)
\]

SO 10 Compute overhead controllable and volume variance.
In computing the overhead variances, it is important to remember the following.

1. Standard hours allowed are used in each of the variances.

2. Budgeted costs for the controllable variance are derived from the flexible budget.

3. The controllable variance generally pertains to variable costs.

4. The volume variance pertains solely to fixed costs.
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