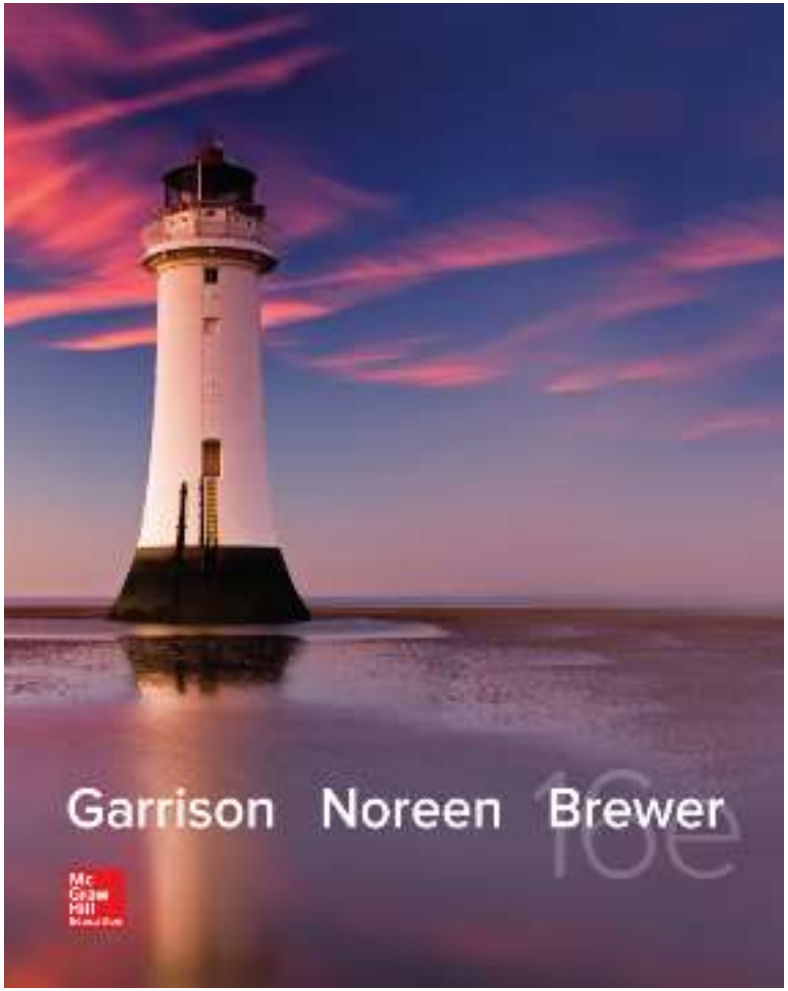
Managerial Accounting

Sixteenth Edition



Chapter 11

Performance Measurement in Decentralized Organizations

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Decentralization in Organizations: Benefits

- Benefits of Decentralization
  - Lower-level decisions often based on better information.
  - Top management freed to concentrate on strategy.
  - Lower-level managers gain experience in decision-making.
  - Lower level managers can respond quickly to customers.
  - Decision-making authority leads to job satisfaction.

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Decentralization in Organizations: Disadvantages

- Disadvantages of Decentralization
  - Lower-level managers may make decisions without seeing the "big picture."
  - May be a lack of coordination among autonomous managers.
  - Lower-level manager's objectives may not be those of the organization.
  - May be difficult to spread innovative ideas in the organization.

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Responsibility Accounting

- Responsibility Center
  - Cost Center
  - Profit Center
  - Investment Center
- Cost, profit, and investment centers are **all** known as Responsibility Centers.

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Cost Center

A segment whose manager has control over costs, but not over revenues or investment funds.

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Profit Center

A segment whose manager has control over **both** costs and revenues, but no control over investment funds.

- Revenues
  - Sales
  - Interest
  - Other
- Costs
  - Mfg. costs
  - Commissions
  - Salaries
  - Other

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Investment Center

A segment whose manager has control over costs, revenues, and investments in operating assets.

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Learning Objective 1

Compute return on investment (ROI) and show how changes in sales, expenses, and assets affect ROI.

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Return on Investment (ROI) Formula

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Average operating assets}}$$

Net operating income is the Income before interest and taxes (EBIT)

Average operating assets is the Cash, accounts receivable, inventory, plant and equipment, and other productive assets.

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Net Book Value versus Gross Cost

Most companies use the net book value of depreciable assets to calculate average operating assets.

Acquisition cost
Less: Accumulated depreciation
Net book value

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Understanding ROI

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Average operating assets}}$$

$$\text{Margin} = \frac{\text{Net operating income}}{\text{Sales}}$$

$$\text{Turnover} = \frac{\text{Sales}}{\text{Average operating assets}}$$

$$\text{ROI} = \text{Margin} \times \text{Turnover}$$

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Increasing ROI: An Example

Regal Company reports the following:

Net operating income	$ 30,000
Average operating assets	$ 200,000
Sales	$ 500,000
Operating expenses	$ 470,000

What is Regal Company's ROI?

ROI = Margin $\times$ Turnover

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average operating assets}}$$

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Increasing ROI – An Example: Solution

ROI = Margin × Turnover

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average operating assets}}$$

$$\text{ROI} = \frac{\$30{,}000}{\$500{,}000} \times \frac{\$500{,}000}{\$200{,}000}$$

$$\text{ROI} = 6\% \times 2.5 = 15\%$$

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Investing in Operating Assets to Increase Sales – An Example

Assume that Regal's manager invests in a $30,000 piece of equipment that increases sales by $35,000, while increasing operating expenses by $15,000.

Regal Company reports the following:

Net operating income	$ 50,000
Average operating assets	$ 230,000
Sales	$ 535,000
Operating expenses	$ 485,000

Let's calculate the new ROI.

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Investing in Operating Assets to Increase Sales – An Example: Solution

ROI = Margin × Turnover

$$\text{ROI} = \frac{\text{Net operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average operating assets}}$$

$$\text{ROI} = \frac{\$50{,}000}{\$535{,}000} \times \frac{\$535{,}00}{\$230{,}000}$$

ROI = 9.35% × 2.33 = 21.8%

ROI increased from 15% to 21.8%.

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Criticisms of ROI

- In the absence of the balanced scorecard, management may not know how to increase ROI.
- Managers often inherit many committed costs over which they have no control.
- Managers evaluated on ROI may reject profitable investment opportunities.

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Learning Objective 2

Compute residual income and understand its strengths and weaknesses.

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Residual Income – Another Measure of Performance

Residual Income is net operating income above some minimum return on operating assets.

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Calculating Residual Income

- Residual income = Net operating income – (Average operating assets × Minimum required rate of return)
- This computation differs from ROI.
- ROI measures net operating income earned relative to the investment in average operating assets.
- Residual income measures net operating income earned less the minimum required return on average operating assets.

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Residual Income – An Example

- The Retail Division of Zephyr, Inc. has average operating assets of $100,000 and is required to earn a return of 20% on these assets.
- In the current period, the division earns $30,000.
- **Let's calculate residual income.**

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Residual Income – An Example: Solution

Operating assets	$100,000
Required rate of return	× 20%
Minimum required return	$ 20,000

Actual income	$ 30,000
Minimum required return	(20,000)
Residual income	$ 10,000

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Motivation and Residual Income

Residual income encourages managers to make profitable investments that would be rejected by managers using ROI.

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Quick Check 1

Redmond Awnings, a division of Wrap-up Corp., has a net operating income of $60,000 and average operating assets of $300,000. The required rate of return for the company is 15%. What is the division's ROI?

a. 25%

b. 5%

c. 15%

d. 20%

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Quick Check 1a

Redmond Awnings, a division of Wrap-up Corp., has a net operating income of $60,000 and average operating assets of $300,000. The required rate of return for the company is 15%. What is the division's ROI?

a. 25%

b. 5%

c. 15%

d. 20%

Answer: d

ROI = NOI/Average operating assets

= $60,000/$300,000 = 20%

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Quick Check 2

Redmond Awnings, a division of Wrap-up Corp., has a net operating income of $60,000 and average operating assets of $300,000. If the manager of the division is evaluated based on ROI, will she want to make an investment of $100,000 that would generate additional net operating income of $18,000 per year?

a. Yes

b. No

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Quick Check 2a

Redmond Awnings, a division of Wrap-up Corp., has a net operating income of $60,000 and average operating assets of $300,000. If the manager of the division is evaluated based on ROI, will she want to make an investment of $100,000 that would generate additional net operating income of $18,000 per year?

a. Yes

b. No

Answer: b

ROI = $78,000/$400,000 = 19.5%

This lowers the division's ROI from 20.0% down to 19.5%.

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Quick Check 3

The company's required rate of return is 15%. Would the company want the manager of the Redmond Awnings division to make an investment of $100,000 that would generate additional net operating income of $18,000 per year?

a. Yes

b. No

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Quick Check 3a

The company's required rate of return is 15%. Would the company want the manager of the Redmond Awnings division to make an investment of $100,000 that would generate additional net operating income of $18,000 per year?

a. Yes

b. No

Answer: a

ROI = $18,000/$100,000 = 18%

The return on the investment exceeds the minimum required rate of return.

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Quick Check 4

Redmond Awnings, a division of Wrap-up Corp., has a net operating income of $60,000 and average operating assets of $300,000. The required rate of return for the company is 15%. What is the division's residual income?

a. $240,000

b. $ 45,000

c. $ 15,000

d. $ 51,000

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Quick Check 4a

Redmond Awnings, a division of Wrap-up Corp., has a net operating income of $60,000 and average operating assets of $300,000. The required rate of return for the company is 15%. What is the division's residual income?

a. $240,000

b. $ 45,000

c. $ 15,000

d. $ 51,000

Answer: c

Net operating income	$60,000
Required return (15% of $300,000)	(45,000)
Residual income	$15,000

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Quick Check 5

If the manager of the Redmond Awnings division is evaluated based on residual income, will she want to make an investment of $100,000 that would generate additional net operating income of $18,000 per year?

a. Yes

b. No

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Quick Check 5a

If the manager of the Redmond Awnings division is evaluated based on residual income, will she want to make an investment of $100,000 that would generate additional net operating income of $18,000 per year?

a. Yes

b. No

Answer: a

Net operating income	$78,000	
Required return (15% of $400,000)		(60,000)
Residual income		$18,000

Yields an increase of $3,000 in the residual income.

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Divisional Comparisons and Residual Income

- The residual income approach has one major **disadvantage**.
- It cannot be used to compare the performance of divisions of different sizes.

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Zephyr, Inc. – Part 1

- Recall the following information for the Retail Division of Zephyr, Inc.
- Assume the following information for the Wholesale Division of Zephyr, Inc.

	Retail	Wholesale
Operating assets	$ 100,000	$1,00,000
Required rate of return ×	20%	20%
Minimum required return	$ 20,000	$ 200,000

	Retail	Wholesale
Actual income	30,000	$ 220,000
Minimum required return	(20,000)	(200,000)
Residual income	$ 10,000	$ 20,000

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Zephyr, Inc. – Part 2

The residual income numbers suggest that the Wholesale Division **outperformed** the Retail Division because its residual income is $10,000 higher. However, the Retail Division earned an ROI of 30% compared to an ROI of 22% for the Wholesale Division. The Wholesale Division's residual income is larger than the Retail Division **simply because it is a bigger division.**

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Learning Objective 3

Compute throughput time, delivery cycle time, and manufacturing cycle efficiency (MCE).

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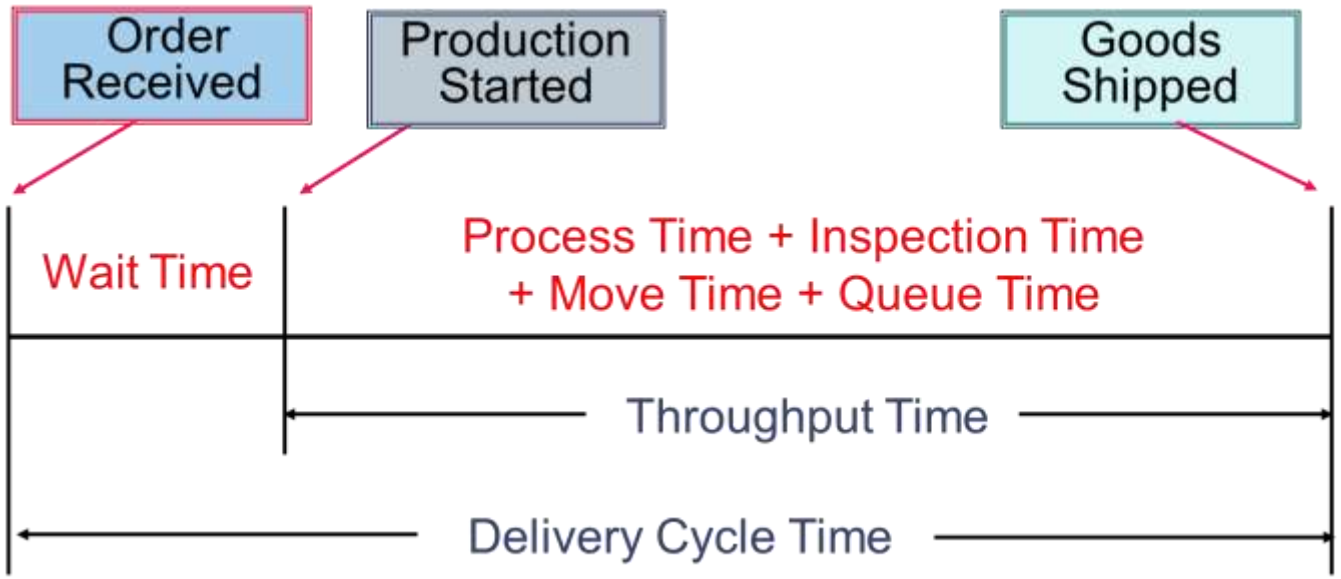
Delivery Performance Measures – Part 1



Process time is the only value-added time.

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Delivery Performance Measures – Part 2

$$\text{Process Time} = \text{Value-added time}$$

$$\text{Manufacturing Cycle Efficiency} = \frac{\text{Value} - \text{added time}}{\text{Manufacturing cycle time}}$$

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Quick Check 6

A TQM team at Narton Corp has recorded the following average times for production:

- Wait 3.0 days
- Inspection 0.4 days
- Process 0.2 days
- Move 0.5 days
- Queue 9.3 days

What is the throughput time?

a. 10.4 days.

b. 0.2 days.

c. 4.1 days.

d. 13.4 days.

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Quick Check 6a (1 of 2)

A TQM team at Narton Corp has recorded the following average times for production:

- Wait 3.0 days
- Inspection 0.4 days
- Process 0.2 days
- Move 0.5 days
- Queue 9.3 days

What is the throughput time?

a. 10.4 days.

b. 0.2 days.

c. 4.1 days.

d. 13.4 days.

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Quick Check 6a (2 of 2)

Answer: a

Throughput time = Process + Inspection + Move + Queue

= 0.2 days + 0.4 days + 0.5 days + 9.3 days

= 10.4 days

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Quick Check 7

A TQM team at Narton Corp has recorded the following average times for production:

- Wait 3.0 days
- Inspection 0.4 days
- Process 0.2 days
- Move 0.5 days
- Queue 9.3 days

What is the delivery cycle time (DCT)?

a. 0.5 days.
b. 0.7 days.
c. 13.4 days.
d. 10.4 days.

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Quick Check 7a (1 of 2)

A TQM team at Narton Corp has recorded the following average times for production:

- Wait 3.0 days
- Inspection 0.4 days
- Process 0.2 days
- Move 0.5 days
- Queue 9.3 days

What is the delivery cycle time (DCT)?

a. 0.5 days.
b. 0.7 days.
c. 13.4 days.
d. 10.4 days.

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Quick Check 7a (2 of 2)

Answer: c

DCT = Wait time + Throughput time

= 3.0 days + 10.4 days

= 13.4 days

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Quick Check 8

A TQM team at Narton Corp has recorded the following average times for production:

- Wait 3.0 days
- Inspection 0.4 days
- Process 0.2 days
- Move 0.5 days
- Queue 9.3 days

What is the Manufacturing Cycle Efficiency (MCE)?

a. 50.0%.
b. 1.9%.
c. 52.0%.
d. 5.1%.

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Quick Check 8a (1 of 2)

A TQM team at Narton Corp has recorded the following average times for production:

- Wait 3.0 days
- Inspection 0.4 days
- Process 0.2 days
- Move 0.5 days
- Queue 9.3 days

What is the Manufacturing Cycle Efficiency (MCE)?

a. 50.0%.
b. 1.9%.
c. 52.0%.
d. 5.1%.

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Quick Check 8a (2 of 2)

Answer: b

MCE = Value-added time ÷ Throughput time

= Process time ÷ Throughput time

= 0.2 days ÷ 10.4 days

= 1.9%

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Learning Objective 4

Understand how to construct and use a balanced scorecard.

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The Balanced Scorecard

Management translates its strategy into performance measures that employees understand and influence.

- Performance measures
  - Financial
  - Internal business processes
  - Customer
  - Learning and growth

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The Balanced Scorecard – From Strategy to Performance Measures (1 of 2)

- Performance Measures
  - **Learning and Growth:** Are we maintaining our ability to change and improve?
  - **Internal Business Processes:** Have we improved key business processes so that we can deliver more value to customers?
    - What internal business processes are critical to providing value to customers? Vision and Strategy

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The Balanced Scorecard – From Strategy to Performance Measures (2 of 2)

- **Customer:** Do customers recognize that we are delivering more value?
  - What customers do we want to serve and how are we going to win and retain them? Vision and Strategy
- **Financial:** Has our financial performance improved?
  - What are our financial goals? Vision and Strategy

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The Balanced Scorecard – Non-financial Measures

- The balanced scorecard relies on non-financial measures in addition to financial measures for two reasons:
  1. Financial measures are lag indicators that summarize the results of past actions. Non-financial measures are leading indicators of future financial performance.
  2. Top managers are ordinarily responsible for financial performance measures – not lower level managers. Non-financial measures are more likely to be understood and controlled by lower level managers.

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The Balanced Scorecard for Individuals

- The entire organization should have an overall balanced scorecard.
- Each individual should have a personal balanced scorecard.
- A personal scorecard should contain measures that can be influenced by the individual being evaluated and that support the measures in the overall balanced scorecard.

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The Balanced Scorecard – Important Links

- A balanced scorecard should have measures that are linked together on a cause-and-effect basis.
- If we improve one performance measure . . .

  Then Another desired performance measure will improve.
- The balanced scorecard lays out concrete actions to attain desired outcomes.

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The Balanced Scorecard and Compensation

Incentive compensation should be linked to balanced scorecard performance measures.

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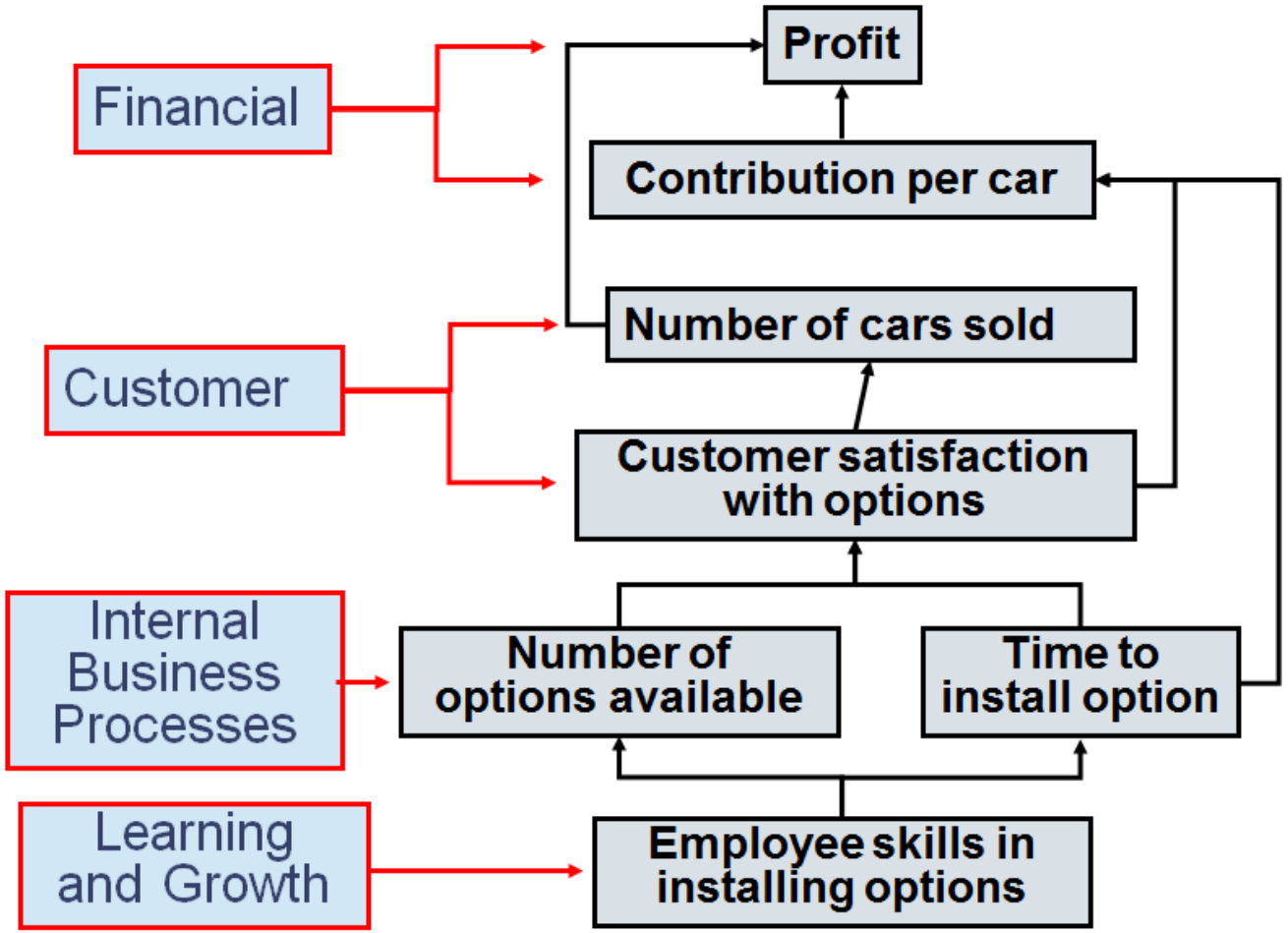
The Balanced Scorecard – Jaguar Example – Part 1



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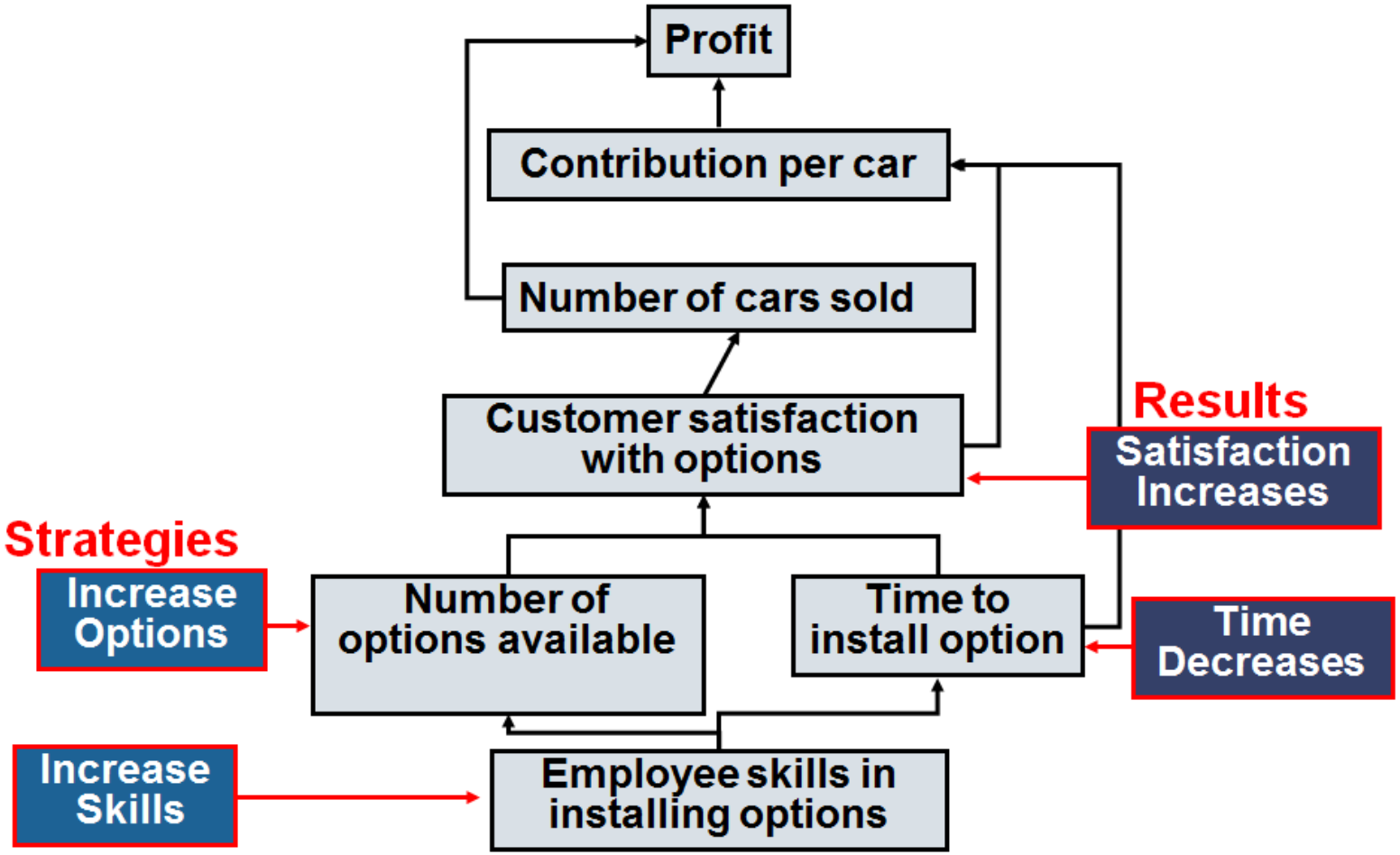
The Balanced Scorecard – Jaguar Example – Part 2



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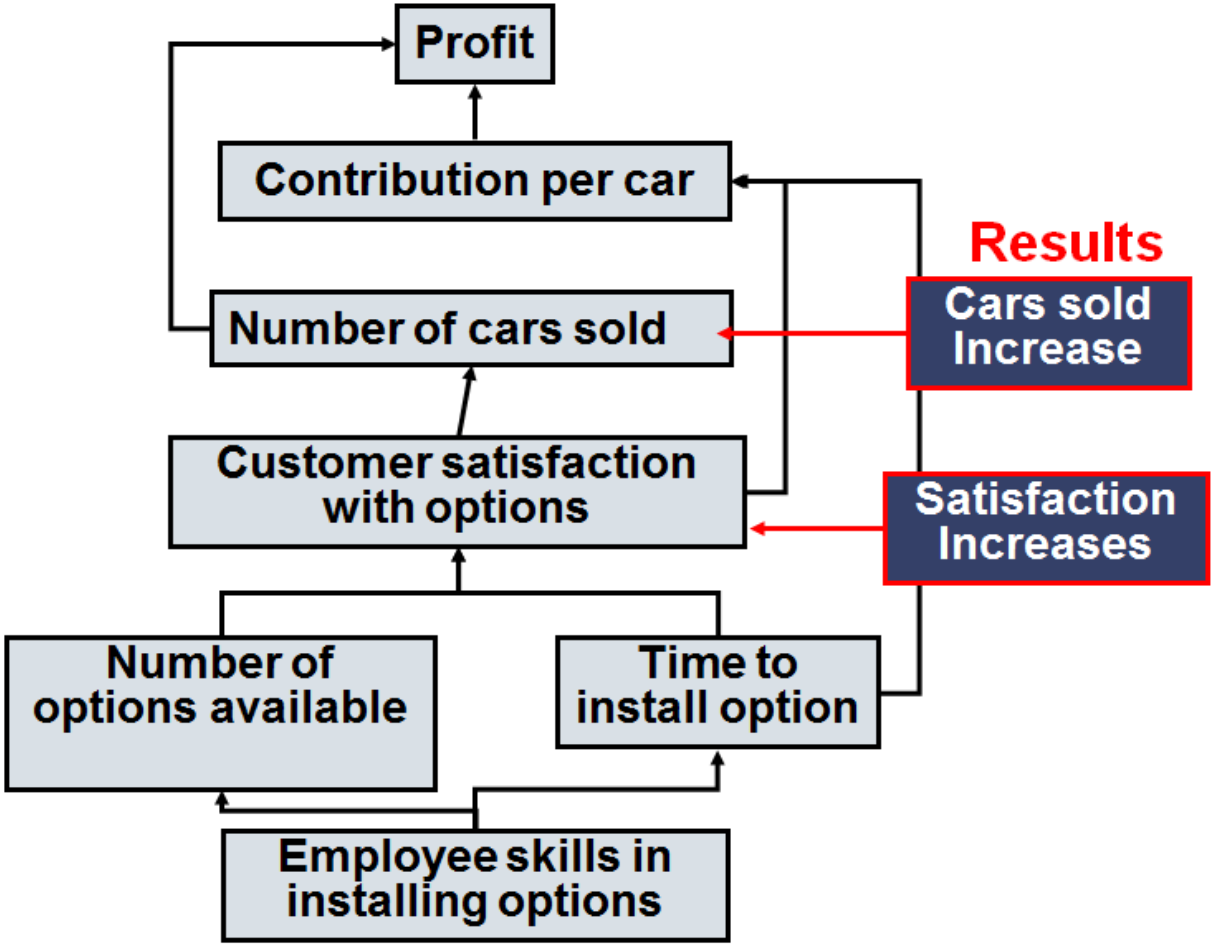
The Balanced Scorecard – Jaguar Example – Part 3



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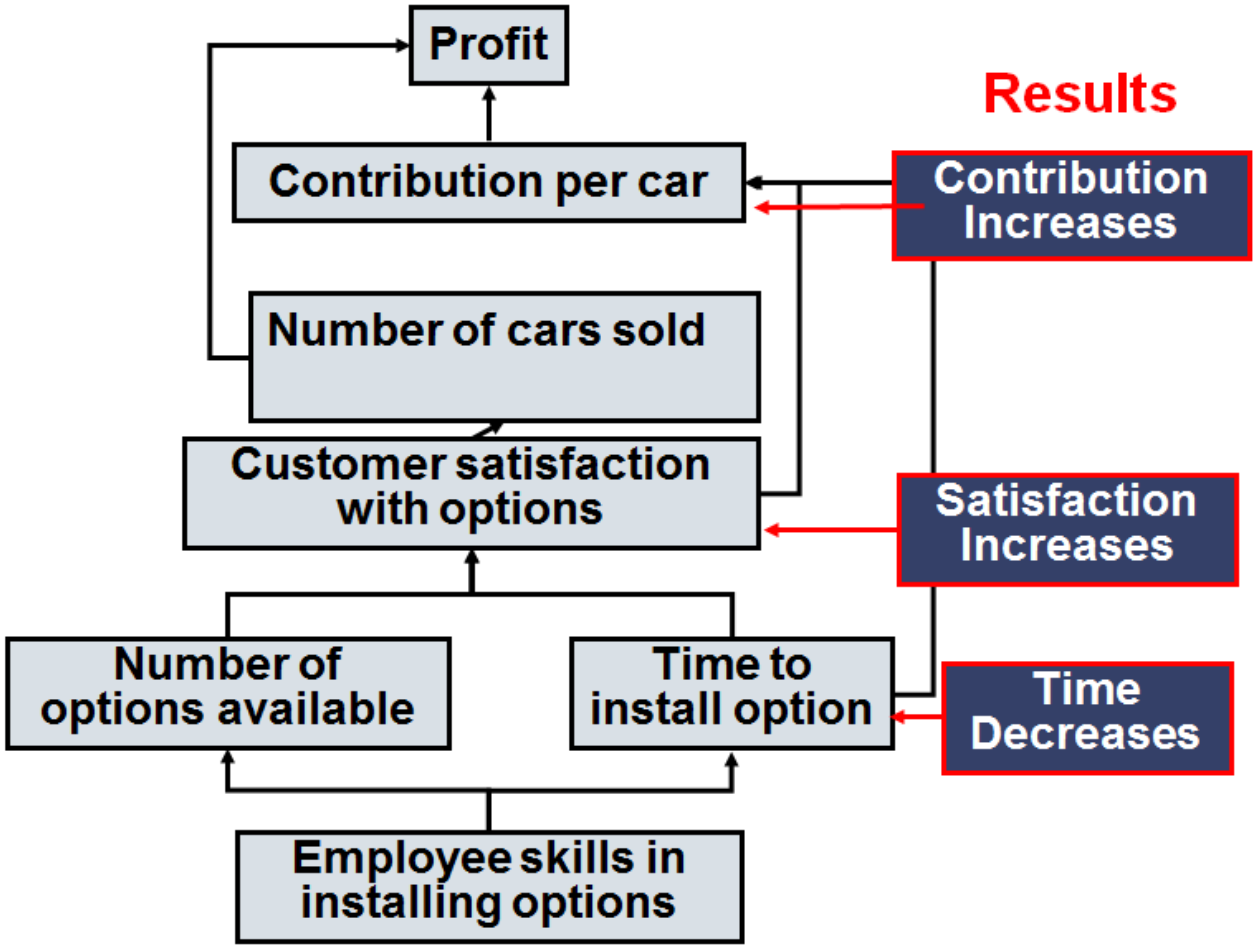
The Balanced Scorecard – Jaguar Example – Part 4



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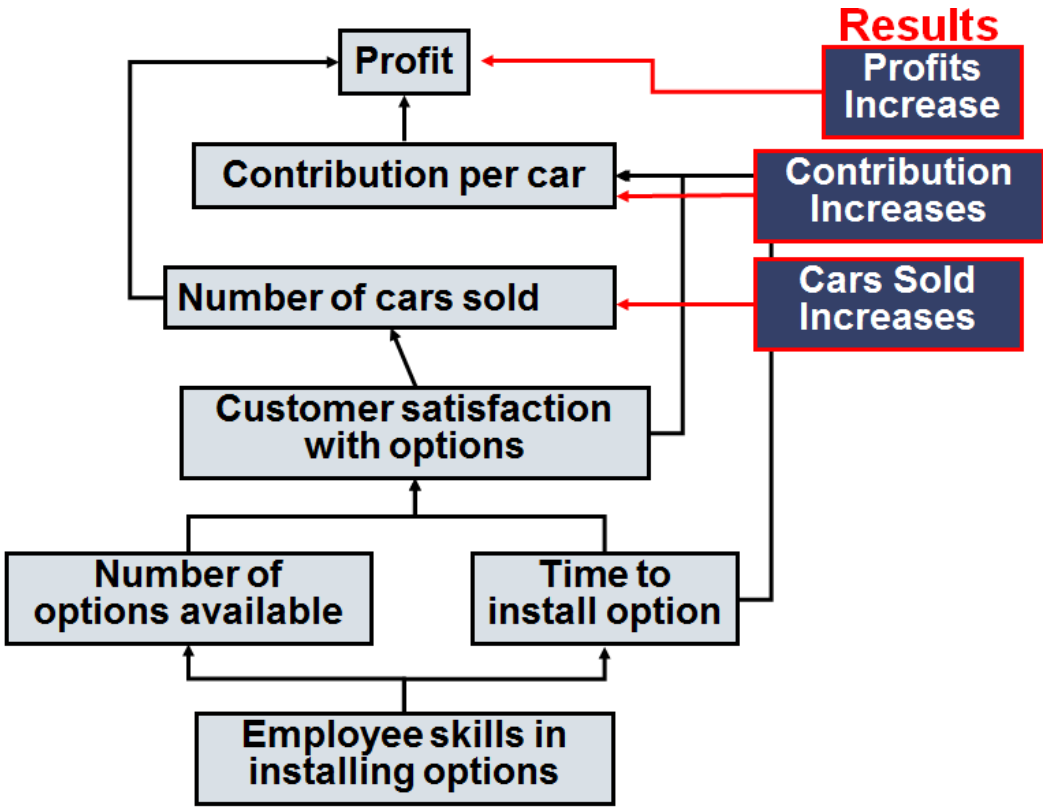
The Balanced Scorecard – Jaguar Example – Part 5

If number of cars sold and contribution per car increase, profit should increase.



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