

# *Solution Manual for Principles of Operations Management* *9th Edition Heizer Render 0132968363 9780132968362*

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## CHAPTER

### Operations Strategy in a Global Environment

#### DISCUSSION QUESTIONS

1. Global seems the better label for Boeing since authority and responsibility reside in the U.S.—the home country.
2. Six reasons to internationalize: Reduce costs, improve supply chain, provide better goods and services, attract new markets, learn to improve operations, attract and retain global talent.
3. No. Sweetness at Coca-Cola is adjusted for the tastes of individual countries.
4. A **mission** is an organization's purpose—what good or service it will contribute to society.
5. **Strategy** is an organization's action plan—how it is going to achieve its purpose.
6. A **mission** specifies where the organization is going and a **Strategy** specifies how it is going to get there.
7. The answer to this question will depend on the establishment studied, but should probably include some of the following considerations:

The mission: diagnose automobile problems and make the necessary repair at a fair price for the local customer.

Points to consider, or options, within the 10 decision areas are:

<b>Decision:</b>	<b>Option:</b>
Product	Repair work of American and/or foreign vehicles; specialized (tune-ups, lubrication, wheel alignment, etc.) versus general repair; frame and body repair versus engine and power train repair; repair and maintenance only, versus repair, maintenance, and sales of fuel; professional staffing versus rental of tools and space for do-it-yourself repair work
Quality	Appropriate level of quality; warranty; method of measuring and maintaining quality (customer complaints, inspection by supervising mechanic, etc.)
Process	Use of general versus special purpose diagnostic and repair equipment (in particular, the degree to which computer controlled diagnostic equipment is employed)
Location	In-town, shopping mall, highway

Layout	Single bay/multibay; general-purpose bay versus special-purpose bay (lubrication/tire repairs and installation/wheel alignment/engine and power train repair, etc.)
Human resources	Employment of certified versus noncertified repair persons; employment of specialists versus general mechanics
Supply Chain	Choice of supplier(s) for both general and original manufacturer parts and supplies
Scheduling	Hours of operation (8:00 A.M.–5:00 P.M.; 24-hour towing; weekends/holidays), repairs versus motor vehicle safety inspections, etc.; service by appointment versus walk-in (or drive-up) service
Inventory	Quantity and variety of repair parts (fan belts, filters, mufflers, headlights, etc.) to stock; whether to stock generic or original manufacturer parts
Maintenance	Bays with hydraulic lifts vs. easier-to-maintain “basement” work areas. Preventive maintenance of equipment vs. breakdown.

8. Library or Internet assignment: Student is to identify a mission and strategy for a firm. **BusinessWeek**, **Fortune**, **The Wall Street Journal**, and **Forbes** all have appropriate articles.

9. OM strategy change during a product’s life cycle: During the introduction stage, issues such as product design and development are critical, then during the growth stage the emphasis changes to product and process reliability; from there we move to concern for increasing the stability of the manufacturing process and cost cutting; and finally, in the decline stage pruning the line to eliminate items not returning good margin becomes important. Figure 2.5 provides a more expansive list.

10. The text focuses on three conceptual strategies—cost leadership, differentiation and response. Cost leadership by Walmart—via low overhead, vicious cost reduction in the supply chain; Differentiation, certainly any premium product—all fine dining restaurants, up-scale autos—Lexus, etc.; Response, your local pizza delivery service, FedEx, etc.

11. An operations strategy statement for Southwest Airlines would include a focus on efficient, low-cost service with high capital utilization (high aircraft and gate utilization), flexible nonunion employees, low administrative overhead, etc. Southwest’s strategy is complicated by the purchase of AirTran. First, there is a major organizational culture issue. Southwest’s culture is unique. The company really does think of itself as a family, with a fun culture. AirTran’s culture is different. Integrating the two cultures will be a challenge. Related to this are human resources issue such as seniority, pay rate, and promotion policies, all of which are complicated by union issues. On the tangible side, Southwest’s use of just Boeing 737s is complicated by AirTran’s

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use of several other types of planes. To maintain the “one plane” efficiency (pilot training maintenance, inventory, etc.), Southwest is going to have to replace all those planes. This will be expensive, but so will **not** getting rid of them.

12. The integration of OM with marketing and accounting is pervasive. You might want to cite examples such as developing new products. (Marketing must help with the design, the forecast and target costs; accounting must ensure adequate cash for development and the necessary capital equipment.) Similarly, new technology or new processes emanating from operations must meet the approval of marketing and the capital constraints imposed by the accounting department.

13. To summarize outsourcing trends:
- Not everyone who outsources is 100% satisfied, and future arrangements may be revised or insourced. ■ IT will be a major expansion area, according to Gartner, Inc.
  - More laws may be passed to protect U.S. jobs.
  - Foreign firms will increase their outsourcing to the U.S.
  - Outsourcing will continue to grow.
  - Current practices will be improved.

14. Cost savings in recent years from outsourcing has been significant. It may be possible to reduce labor costs by as much 75%. But more realistically, this figure is in the 20%–40% range. **Overall** savings in the 10%–30% range are possible.

15. Internal issue include:

- Employment—morale may drop, and employees may lose their jobs.
- Facilities—may need to be changed if components arrive in different stages of assembly.
- Logistics—now includes customs, timing and insurance.

16. The company should identify its own core competencies and then consider a list of candidate activities and firms for outsourcing. The factor-rating method can be used to compare various companies on a set of factors that management considers important.

17. Bad outsourcing decisions may result in:

- Higher transportation cost
- Loss of control
- Future competition from the provider
- Negative impact on employees
- Quick gains at the expense of long-term objectives

18. McDonald’s fits the categorization in the text as a **multidomestic**, as opposed to **international**, **global**, or **transnational**. This is the concept of exporting the management talent and process allowing flexibility in the product itself. In the case of McDonald’s, this export is operations management expertise, which it has implemented world-wide. Interestingly, McDonald’s likes to call itself **multilocal**.

## ETHICAL DILEMMA

Here is an interesting scenario. A firm can save \$10 million in production costs per year. All it has to do is locate manufacturing in China, which is not a democracy, where sustainability is not an issue, and where some employees are exploited. Nike faced a similar dilemma in Vietnam, where it was accused of paying less than a livable wage (\$1.60 per day). Students may be prepared to discuss this current and sensitive subject.

## END-OF-CHAPTER PROBLEMS

**2.1** The three methods are cost leadership, differentiation, and response. Cost leadership can be illustrated by Walmart, with low overhead and huge buying power to pressure its suppliers into concessions. Differentiation can be illustrated by almost any restaurant or restaurant chain, such as Red Lobster, which offers a distinct menu and style of service than others. Response can be illustrated by a courier service such as FedEx, that guarantees specific delivery schedules; or by a custom tailor, who will hand make a suit specifically for the customer.

**2.2** Cost leadership: institutional food services, such as Sodexo, provide meal service to college campuses and similar institutions. Such firms often get their contracts by being low bidder to provide service. Response: a catering firm (the customer picks the menu, time, and date). Differentiation: virtually all restaurants seek differentiation in menu, in taste, in service. This is particularly true of fine dining restaurants, but also true of fast food restaurants. For instance, Burger King likes to talk about meals “anyway you want them,” and McDonald’s has a playground or seating area for children.

**2.3** Arrow; Bidermann International, France  
Braun Household Appliances; Procter & Gamble, U.S.

Volvo Autos; Geely, China

Firestone Tires; Bridgestone, Japan

Godiva Chocolate; Campbell Soup, U.S.

Haagen-Dazs Ice Cream; great globalization discussion example:  
Haagen-Dazs was established in New York City; now owned by Pillsbury (U.S.A.), which is owned by General Mills (U.S.A.), but Nestlé SA (Switzerland) is licensed to sell Haagen-Dazs in the U.S.

Jaguar Autos; Tata, India

MGM Movies; Credit Lyonnais, France

Lamborghini; Volkswagen, Germany

Goodrich; Michelin, France

Alpo Pet Foods; Nestlé, Switzerland

**2.4** (a) The maturing of a product may move the OM function to focus on more standardization, make fewer product changes, find optimum capacity, stabilize the manufacturing process, lower labor skills, use longer production runs, and institute cost cutting and design compromises.

(b) Technological innovation in the manufacturing process may mean new human resources skills (either new personnel and/or training of existing personnel), and added capital investment for new equipment or processes. Product design, layout, maintenance procedures, purchasing, inventory, quality standards, and procedures may all need to be revised.

(c) A design change will, at least potentially, require the same changes as noted in (b).

**2.5** Specific answers to this question depend on the organization considered. Some general thoughts follow:

(a) For a producer with high energy costs, major oil prices change the cost structure, result in higher selling prices, and, if the company is energy inefficient compared to other producers, result in a change in

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Selection Criteria	Criteria Weight	Computations for Manila	Computations for Delhi	Computations for Moscow	
(b) More restrictive quality of water and air legislation in-creases the cost of production and may, in some cases, prohibit the use of specific technologies. The high cost of process modification to meet more rigid standards has resulted in the closing of numerous plants including paper mills and steel mills.	1. Flexibility 2. Trustworthiness 3. Price 4. Delivery	0.5 0.1 0.2 0.2	0.5 5 = 2.5 0.1 5 = 0.5 0.2 4 = 0.8 0.2 5 = 1.0	0.5 1 = 0.5 0.1 5 = 0.5 0.2 3 = 0.6 0.2 6 = 1.2	0.5 9 = 4.5 0.1 2 = 0.2 0.2 6 = 1.2 0.2 6 = 1.2
(c) A decrease in the number of young prospective em-ployees entering the U.S. labor market can contribute to a tighter job market. High unemployment rates can have the opposite effect.	Total score	1.0	4.8	2.8	7.1
(d) Inflation, especially at high or uncertain rates, makes it more difficult to predict both the cost of production and the market demand.					
(e) Legislation moving health insurance from a before-tax benefit to taxable income will reduce the take-home pay of					

employees by the amount of the taxes. This could have a significant effect on some of the classifications, putting substantial pressure on operations managers to increase wages in these classifications. (This does not mean that it is not a good idea for society—i.e., to make employees more sensitive to the cost of health insurance.)

**2.6** The corruption perception index maintained by Transparency International ([www.transparency.org](http://www.transparency.org)) gives a 1-to-10 scale (10

being least corrupt to 1 being most corrupt). Also see Chapter 8, Table 8.2.

A lively class discussion can also take place regarding who pays bribes, as shown on the same Web site. Other perspectives of culture are shown on the Asia Pacific Management Forum page ([www.apmforum.com](http://www.apmforum.com)).

**2.7 The Economist** does an analysis similar to this on occasion but the “Global Competitiveness Index,” **World Economic Forum**, Geneva ([www.weforum.org](http://www.weforum.org)) does one every year. (Also see Table 8.1 in the text.) For 2011–2012, Switzerland, 1; Singapore, 2; Sweden, 3; Finland, 4; and U.S., 5 are some rankings.

**2.8** (a) Using the weighted model, with the four weights totaling 1.0, England has a risk of 2.3 and Canada a risk of 1.7. Now Canada is selected.

$$\text{England} = .1(2) + .6(3) + .2(1) + .1(1) = 2.3$$

$$\text{Canada} = .1(3) + .6(1) + .2(3) + .1(2) = 1.7$$

(b) When each of the weights is doubled, the selection stays the same: Canada.

**2.9** With weights given, the results are:

$$\text{Mexico} = 3.3 = [.4(1) + .2(7) + .1(3) + .1(5) + .1(4) + .1(3)]$$

$$\text{Panama} = 4.1$$

$$\text{Costa Rica} = 4.4$$

$$\text{Peru} = 4.2$$

Mexico is the lowest-risk country for the firm to outsource to.

**2.10** (a) The results of the factor rating method are:

	<u>Overnight Shipping</u>	<u>Worldwide Delivery</u>	<u>United Freight</u>
Weighted total	800	815	775

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### CASE STUDY

#### MINIT-LUBE

1. What constitutes the mission of Minit-Lube?

To provide economical preventative maintenance and interior auto cleaning, primarily to vehicles owned by individuals (as opposed to businesses), in the U.S.

2. How does the Minit-Lube strategy provide competitive advantage?

This case is a good way to get the student thinking about the 10 decisions around which the text is organized. Minit-Lube’s approach to these 10 decisions includes:

- **Product design:** A narrow product strategy could be defined as “lubricating automobiles” (more in Chapter 5).
- **Quality strategy:** Because of limited task variety, high repetition, good training, and good manuals, quality should be relatively easy to maintain.

Weighted average	80	81.5	77.5
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The best outsource provider is Worldwide Delivery.

- (b) Nothing changes in the weighted averages if every one of the weights is doubled. The weighted totals will double.
- (c) If the three Overnight Shipping ratings increase by 10%, to 99, 77, and 77, respectively, the new weighted average is 88, and the weighted sum is 880. So Overnight is now the preferred logistics provider.

#### 2.11

Moscow Bell is clearly the highest rated for Walker’s help desk.

#### 2.12

Provider	Score
A	$5W + 320 = (60 + 15 + 125 + 15 + 30 + 75)$
B	$4W + 330$
C	$3W + 370$
D	$5W + 255$

Find all  $w$  from 1–30 so that:

$$3w + 370 \leq 5w + 320, \text{ or } 50 \leq 2w, \text{ or } w \geq 25$$

$$3w + 370 \leq 4w + 330, \text{ or } 40 \leq w, \text{ or } w \geq 40$$

$$3w + 370 \leq 5w + 255, \text{ or } 115 \leq 2w, \text{ or } w \geq 57.5$$

Company C is recommended for all  $w$  such that  $1.0 \leq w \leq 25.0$

### ADDITIONAL HOMEWORK PROBLEM

**Problem 2.13** appears at [www.myomlab.com](http://www.myomlab.com) and [www.pearsonhighered.com/heizer](http://www.pearsonhighered.com/heizer).

**2.13** Global. Its level of integration goes beyond multinational. The collection of parts and subassemblies coming from other countries is carefully orchestrated. It is not transnational because its “home” is clearly the U.S., and there is little sense of “local responsiveness.”

- **Process strategy:** The process strategy allows employees and capital investment to focus on doing this mission well, rather than trying to be a “general purpose” garage or gas station.
- **Location strategy:** Facilities are usually located near residential areas.
- **Layout strategy:** The three bays are designed specifically for the lubrication and vacuuming tasks to minimize wasted movement on the part of the employees and to contribute to the speedier service.
- **Supply-chain management:** Purchasing is facilitated by negotiation of large purchases and custom packaging.
- **Human resources strategy:** Human resources strategy focuses on hiring a few employees with limited skills and training them in a limited number of tasks during the performance of which they can be closely supervised.
- **Inventory:** Inventory investment should be relatively low, and they should expect a high turnover.

- **Scheduling:** Scheduling is quite straightforward with similar times for most cars. Once volume and fluctuation in volume are determined, scheduling should be very direct—assisting both staffing and customer relations.
  - **Maintenance:** There is relatively little equipment to be maintained, and therefore little preventive maintenance is required. With three bays and three systems, there is backup available in the case of failure.
3. Specialization of personnel and facilities should make MinitLube more efficient. Jobs/tasks accomplished per man hour would be a good place to start.

## VIDEO CASE STUDIES

### 1 STRATEGY AT REGAL MARINE

There is a short video (7 minutes) available from Pearson Prentice Hall and filmed specifically for this text that supplements this case.

1. Regal Marine’s mission is to provide luxury performance boats to the world through constant innovation, unique features, and high quality that will differentiate the boats in the marketplace.
2. A strength of Regal Marine is continued innovation that is being recognized in the marketplace. One current weakness is maintaining an effective, well-trained labor force in a tight Florida labor market. The **opportunities** for Regal include an increase in boat sales brought about through the reduction of the luxury tax and Regal Marine’s increasing market presence in the world boat market. The **threats** to Regal are a huge number of small competitors going after various parts of the market. Brunswick goes after the mass market, and hundreds of small boat manufacturers go after various niche markets.
3. Regal Marine’s strategy is to focus on constant innovation, high quality, and good value for the money with sales through effective dealers.
4. Each of the 10 operations management decisions is important to Regal’s success:

- **Product:** Must be unique, full of features, and richly appointed, which puts constant pressure on the design, styling, and appointments.
- **Quality:** Because the typical Regal Marine customer is interested in exceptional quality for his/her substantial investment.
- **Process selection and design:** Because of the large number of boats and custom features, building via repetitive processes in a modular way has proven to be an effective and efficient process.
- **Inventory:** Regal tries to drive down finished goods inventory but must maintain inventory of purchased parts to meet changing production schedules. Additionally, the tooling inventory, that is the various molds, create an inventory problem all their own. This is a good point for class discussion, as most students may not be familiar with the process.
- **Scheduling:** Regal tries to move the components from workstation to workstation on a one-day JIT basis. Good, reliable schedules are necessary to get the job done.
- **Supply-chain management:** Of course suppliers are important because of many of the appointments—from galley features through engines, and hardware make a huge difference in the perceptions and performance of marine craft. Consequently, the selection of these suppliers and their performance is critical to Regal.
- **Maintenance:** Much of Regal’s maintenance hinges on keeping fiberglass guns and molds ready for use.
- **Location:** Because Florida is one of the major markets for boats in America, Regal is positioned to supply this large market rapidly and economically.
- **Layout:** Because of the bulkiness of the product, the layout must be designed, as it is, to minimize loads times the distances times the difficulty factor. There is a clean logical flow of material through the plant.
- **Human resources:** Is important because boat hulls, decks, assembly, and finishing out the boats have a high labor content. Additionally, the current diverse labor market in Florida creates special challenges for operations managers at Regal.

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### 2 HARD ROCK CAFE’S GLOBAL STRATEGY

There is a short video (9 minutes) available from Pearson Prentice Hall, and filmed specifically for this text, that supplements this case.

1. Identify the strategic changes that have taken place at Hard Rock Cafe. What we want to do here is help the student understand that an optimum mix of internal strengths and opportunities drives strategies in a changing environment.
  - Initially, Hard Rock was a London cafe serving classic American food.
  - Then it became a “theme” chain with memorabilia in tourist destinations.

- Then it added stores.
  - Then it added live music and a rock concert.
  - Then it became an established name and began opening hotels and casinos.
  - Then it upgraded its menu.
  - Then it moved into cities that are not the typical tourist destination.
2. As these strategic changes have taken place—the 10 decisions of OM change:
    - **Location:** From a London cafe, to tourist destinations, to non-tourist locations.

- **Product design:** New menu items
- **Quality:** The entire evaluation of quality and quality control got much more complex.
- **Process:** The kitchen process changed when Hard Rock went from hamburgers to lobster and additional changes were made as the firm moved to retail merchandising.
- **Layout:** Added retail stores, added live music facilities.
- **Supply-chain management:** Purchase memorabilia and lobsters—new expectations of the supply chain.
- **Inventory:** From food to clothing to memorabilia, to expanded food items in inventory—how do you keep lobsters alive and how long?
- **Human resources:** The range of talents needed keeps expanding; from cooks of classic American fare and wait staff and bartenders, to merchandisers, to cooks for a wider more expensive menu, to coordinators and performers for the live music facilities.

The case says little about scheduling and maintenance, but every change in product (food or merchandise) and every change in equipment and processes changes scheduling and maintenance.

3. Hard Rock fits in the multidomestic strategy, which uses the existing domestic model globally.



### OUTSOURCING OFFSHORE AT DARDEN

The 10 minute video that accompanies this case study is available from Pearson Prentice Hall and was filmed specifically for text.

1. There are numerous outsourcing opportunities available to a restaurant, including food supplies, all other supplies, janitorial, data processing, benefits, marketing, and book-keeping. Darden outsources the seafood and produce part of its supply chain, but maintains tight quality standards “from farm to fork.”
2. When a giant like Darden procures supplies in 35 countries, it needs to have a large staff “on the ground” to arrange for training, quality control, contracts, expediting, language/cultural issues, and so on. With very tight standards, it will not use a supplier until all its expectations for reliability/quality are met. Once trained, a supplier need not be managed as closely, freeing Darden supply chain personnel to seek out the next provider.
3. In other industries, perhaps where 48-hour freshness is not a critical issue, supply chains may differ. Challenges come from culture, communications, distance, and documents. Companies like Walmart have used alliances. P&G reorganized along product lines instead of geography to increase coordination. Mercedes decided to build some models in the U.S. to get closer to customers.
4. Darden outsources seafood harvesting and preparation offshore because (a) it may not legally own/control the catch in foreign waters; (b) labor intensity of food preparation means it is cheaper for that work to be done offshore; (c) bulk food purchases are capital intensive and not part of Darden’s core competence.