

## CHAPTER 2 STRATEGY AND SUSTAINABILITY

### Discussion Questions

1. What is meant by triple-bottom-line strategy? Give an example of a company that has adopted this type of strategy.

*A triple-bottom-line strategy places emphasis on a company's environmental and social responsibilities as well as the traditional bottom line of economic prosperity. It recognizes that the long-term health of the firm is interdependent with the health of the environment and the betterment of society. There are many examples – an interesting one is Ben & Jerry's, famous for their all natural ice cream. Do a search "Ben & Jerry's Corporate Social Responsibility" to find their current statements related to this.*

2. Find examples where companies have used features related to environmental sustainability to win new customers.

*Car companies use environmental concerns in marketing ads. The development of hybrid and flex-fuel cars is one way they have operationalized those concerns. Consumer goods companies display the "made with recycled material" logo on the packaging. Bottled water manufacturers are using and advertising bottles made with less plastic.*

3. What are the major priorities associated with operations and supply chain strategy? How has their relationship to each other changed over the years?

*The four major imperatives are cost, quality, delivery, and flexibility. In the sixties, these four imperatives were viewed from a tradeoffs perspective. For example, this meant that improving quality would result in higher cost, and in many cases that was true. However, advances in manufacturing and information technologies since then have reduced the size of those tradeoffs, allowing firms to improve on several or all of these imperatives simultaneously, gaining greater competitive advantage than was possible 50 years ago. The problem now becomes one of prioritizing and managing towards orderly improvement.*

4. Why does the proper operations and supply chain strategy keep changing for companies that are world-class competitors?

*The top three priorities have generally remained the same over time: make it good, make it fast, and deliver it on time. Others have changed. Part of this may be explained by realizing that world class organizations have achieved excellence in these three areas and are, therefore, focusing attention on some of the more minor areas to gain competitive advantage. The changes in the minor priorities may result from recognizing opportunities or from changes in customer desires or expectations.*

5. What do the expressions *order winners* and *order qualifiers* mean? What was the order winner(s) for your last purchase of a product or service?

*Order winners are dimensions that differentiate the product or service or services of one firm from another. Order qualifiers are dimensions that are used to screen a product or service as a candidate for purchase. Order qualifiers get a company's "foot in the door." Order winners are what make the sale. Obviously, answers will vary for the order winners from your last purchase.*

6. Pick a company that you are familiar with and describe its operations strategy and how it relates to winning customers. Describe specific activities used by the company that support the strategy.

*Student answers will vary widely based on their experiences and views. It might be helpful for a classroom exercise to assign certain companies to a number of students/teams and compare their answers in class.*

7. At times in the past, the dollar showed relative weakness with respect to foreign currencies, such as the yen, mark, and pound. This stimulated exports. Why would long-term reliance on a lower valued dollar be at best a short-term solution to the competitiveness problem?

*This approach is dependent on economic policies of other nations. This is a fragile dependency. A long-term approach is to increase manufacturing and service industry productivity in order to regain competitive advantage. At a national level, solutions appear to lie in reversing attitudes. At a firm level, competitive weapons are consistent quality, high performance, dependable delivery, competitive pricing, and design flexibility.*

8. Identify an operations and supply chain - related disruption that recently impacted a company. What could the company have done to have minimized the impact of this type of disruption prior to it occurring?

*The March 2011 tsunami that struck Japan was geographically concentrated but had global impact on multiple firms, many of which had no physical presence at all in the affected area. Examples include firms that had sole source agreements with suppliers in the affected area. The tsunami left these companies scrambling to find new suppliers to feed into their supply chains. These firms could have reduced the impact of the tsunami by having a few high-quality, dependable suppliers located in different geographical regions. There are many other examples that could be taken from this one event. A simple Internet search will provide plenty of material for discussion.*

9. What do we mean when we say productivity is a relative measure?

*For productivity to be meaningful, it must be compared with something else. The comparisons can be either intra-company as in the case of year-to-year comparisons of the same measure, or intercompany as in the case of benchmarking. Intercompany comparisons of single factor productivity measures can be somewhat tenuous due to differences in accounting practices (especially when comparing with foreign competitors) and the balance of labor to capital resources. Total factor productivity measures are somewhat more robust for comparison purposes.*

### **Objective Questions**

1. Shell Oil Company's motto "People, Planet and Profit" is a real-world implementation of what OSCM concept?

*Triple bottom line*

2. A firm's *strategy* should describe how it intends to create and sustain value for what entities?

*its current shareholders*

3. What is the term used to describe individuals or organizations that are influenced by the actions of a firm?

*Stakeholders*

4. How often should a company develop and refine the operations and supply chain strategy.

*At least yearly*

5. What is the term used to describe product attributes that attract certain customers and can be used to form the competitive position of a firm?

*Competitive dimensions*

6. What are the two main competitive dimensions related to product delivery?

*Delivery speed and delivery reliability*

7. What are the two characteristics of a product or service that define quality?

*Design quality and process quality*

8. What is the diagram that shows how a company's strategy is delivered by a set of supporting activities?

*activity-system map*

9. In implementing supply chain strategy, a firm must minimize its total cost without compromising the needs of what group of people?

*Customers*

10. What is defined as the likelihood of disruption that would impact the ability of a company to continuously supply products or services?

*Supply chain risk*

11. Risks caused by natural or manmade disasters, and therefore impossible to reliably predict, called?

*Disruption risks*

12. Match the following common risks with the appropriate mitigation strategy.

|                                |   |
|--------------------------------|---|
| <u>E</u> Country risks         | A: Detailed tracking, alternate suppliers     |
| <u>D</u> Regulatory risk       | B: Careful selection and monitoring suppliers |
| <u>A</u> Logistics failure     | C: Contingency planning, insurance            |
| <u>C</u> Natural disaster      | D: Good legal advice, compliance              |
| <u>B</u> Major quality failure | E: Currency hedging, local sourcing           |

13. What is the term used to describe the assessment of the probability of a negative event against the aggregate severity of the related loss?

*Risk mapping*

14. As Operations Manager, you are concerned about being able to meet sales requirements in the coming months. You have just been given the following production report.

|                           | JAN  | FEB  | MAR  | APR  |
|---------------------------|------|------|------|------|
| <b>Units Produced</b>     | 2300 | 1800 | 2800 | 3000 |
| <b>Hours per Machine</b>  | 325  | 200  | 400  | 320  |
| <b>Number of Machines</b> | 3    | 5    | 4    | 4    |

Find the average monthly productivity (units per machine hour).

*To answer this we need to realize that the measure of hours given is per machine, so we have to multiply that by the number of machines in each period to get the total machine hours in each period. Those figures are used in the calculations below.*

*Average productivity:  $(2300/975 + 1800/1000 + 2800/1600 + 3000/1280)/4$*

*Average productivity  $(2.36+1.80+1.75+2.34)/4= 2.06$  units per machine hour*

15. Sailmaster makes high-performance sails for competitive windsurfers. Below is information about the inputs and outputs for one model, the Windy 2000.

|                   |           |
|-------------------|-----------|
| Units sold        | 1,217     |
| Sale price each   | \$1,700   |
| Total labor hours | 46,672    |
| Wage rate         | \$12/hour |
| Total materials   | \$60,000  |
| Total energy      | \$4,000   |

Calculate the productivity in **sales revenue/labor expense**.

*We have to do some interim calculations here. Sales revenue is calculated by multiplying units sold by the unit sales price. Labor expense is calculated by multiplying labor hours by the wage rate.*

$$(1217*1700) / (46672*12) = 3.69$$

16. *Live Trap Corporation* received the data below for its rodent cage production unit. Find the **total** productivity?

| Output                       | Input                        |                 |
|------------------------------|------------------------------|-----------------|
| 50,000 cages                 | Production time              | 620 labor hours |
| Sales price: \$3.50 per unit | Wages                        | \$7.50 per hour |
|                              | Raw materials (total cost)   | \$30,000        |
|                              | Component parts (total cost) | \$15,350        |

*Total productivity could be expressed two ways here based on how you express output: in units sold, or dollars of sales.*

*Units sold:*

$$50,000 / ((620 * \$7.50) + 30,000 + 15,350) = 1.00 \text{ units sold per dollar input}$$

*Dollars of sales:*

$$(50000 * 3.5) / ((620 * \$7.50) + 30,000 + 15,350) = 3.5 \text{ dollars in sales per dollar input}$$

17. Two types of cars (Deluxe and Limited) were produced by a car manufacturer last year. Quantities sold, price per unit, and labor hours follow. What is the labor productivity for each car? Explain the problem(s) associated with the labor productivity.

|                | QUANTITY         | \$/UNIT     |
|----------------|------------------|-------------|
| Deluxe car     | 4,000 units sold | \$8,000/car |
| Limited car    | 6,000 units sold | \$9,500/car |
| Labor, Deluxe  | 20,000 hours     | \$12/hour   |
| Labor, Limited | 30,000 hours     | \$14/hour   |

*Labor Productivity – units/hour*

| Model       | Output in Units | Input in Labor Hours | Productivity (Output/Input) |
|-------------|-----------------|----------------------|-----------------------------|
| Deluxe Car  | 4,000           | 20,000               | 0.20 units/hour             |
| Limited Car | 6,000           | 30,000               | 0.20 units/hour             |

*Labor Productivity – dollars*

| Model       | Output in Dollars               | Input in Dollars              | Productivity (Output/Input) |
|-------------|---------------------------------|-------------------------------|-----------------------------|
| Deluxe Car  | 4,000(\$8,000)=<br>\$32,000,000 | 20,000(\$12.00)=<br>\$240,000 | 133.33                      |
| Limited Car | 6,000(\$9,500)=                 | 30,000(\$14.00)=              | 135.71                      |

|              |           |
|--------------|-----------|
| \$57,000,000 | \$420,000 |
|--------------|-----------|

*The labor productivity measure is a conventional measure of productivity. However, as a partial measure, it may not provide all of the necessary information that is needed. For example, increases in productivity could result from decreases in quality, and/or increases in material cost.*

18. A U.S. manufacturing company operating a subsidiary in an LDC (less-developed country) shows the following results:

|                           | U.S.     | LDC       |
|---------------------------|----------|-----------|
| Sales (units)             | 100,000  | 20,000    |
| Labor (hours)             | 20,000   | 15,000    |
| Raw materials (currency)  | \$20,000 | FC 20,000 |
| Capital equipment (hours) | 60,000   | 5,000     |

- a. Calculate partial labor and capital productivity figures for the parent and subsidiary. Do the results seem misleading?

*Labor Productivity*

| Country | Output<br>in Units | Input<br>in Hours | Productivity<br>(Output/Input) |
|---------|--------------------|-------------------|--------------------------------|
| U.S.    | 100,000            | 20,000            | 5.00 units/hour                |
| LDC     | 20,000             | 15,000            | 1.33 units/hour                |

*Capital Equipment Productivity*

| Country | Output<br>in Units | Input<br>in Hours | Productivity<br>(Output/Input) |
|---------|--------------------|-------------------|--------------------------------|
| U.S.    | 100,000            | 60,000            | 1.67 units/hour                |
| LDC     | 20,000             | 5,000             | 4.00 units/hour                |

*Yes. You might expect the capital equipment productivity measure to be higher in the U.S. than in a LDC. Also, the measures seem contradictory. Each plant appears to be far more productive than the other on one measure, but much worse on the other.*

- b. Compute the multifactor productivity figures for labor and capital together. Do the results make more sense?

*Multifactor – Labor and Capital Equipment*

| Country | Output<br>in Units | Input<br>in Hours          | Productivity<br>(Output/Input) |
|---------|--------------------|----------------------------|--------------------------------|
| U.S.    | 100,000            | 20,000 + 60,000=<br>80,000 | 1.25 units/hour                |
| LDC     | 20,000             | 15,000 + 5,000=<br>20,000  | 1.00 units/hour                |

*Yes, labor and equipment can be substituted for each other. Therefore, this multifactor measure is a better indicator of productivity in this instance.*

- c. Calculate raw material productivity figures (units/\$ where \$1 = FC 10). Explain why these figures might be greater in the subsidiary.

*Raw Material Productivity*

| Country | Output<br>in Units | Input<br>in Dollars         | Productivity<br>(Output/Input) |
|---------|--------------------|-----------------------------|--------------------------------|
| U.S.    | 100,000            | \$20,000                    | 5.00 units/\$                  |
| LDC     | 20,000             | FC 20,000/\$10 =<br>\$2,000 | 10.00 units/\$                 |

*The raw material productivity measures might be greater in the LDC due to a reduced cost paid for raw materials, which is typical of LDC's, especially if there are local sources for the raw materials.*

19. Various financial data for the past two years follow. Calculate the total productivity measure and the partial measures for labor, capital, and raw materials for this company for both years. What do these measures tell you about this company?

|         |               | <u>Last Year</u> | <u>This Year</u> |
|---------|---------------|------------------|------------------|
| Output: | Sales         | \$200,000        | \$220,000        |
| Input:  | Labor         | 30,000           | 40,000           |
|         | Raw materials | 35,000           | 45,000           |
|         | Energy        | 5,000            | 6,000            |
|         | Capital       | 50,000           | 50,000           |
|         | Other         | 2,000            | 3,000            |



*Total Productivity*

| Year      | Output<br>in Dollars | Input<br>in Dollars  | Productivity<br>(Output/Input) |
|-----------|----------------------|--|--------------------------------|
| Last Year | \$200,000            | \$30,000 + 35,000 +<br>5,000 + 50,000 + 2,000<br>= \$122,000 | 1.64                           |
| This Year | \$220,000            | \$40,000 + 45,000 +<br>6,000 + 50,000 + 3,000<br>= \$144,000 | 1.53                           |

*Partial Measure – Labor*

| Year      | Output<br>in Dollars | Input<br>in Dollars | Productivity<br>(Output/Input) |
|-----------|----------------------|---------------------|--------------------------------|
| Last Year | \$200,000            | \$30,000            | 6.67                           |
| This Year | \$220,000            | \$40,000            | 5.50                           |

*Partial Measure – Raw Materials*

| Year      | Output<br>in Dollars | Input<br>in Dollars | Productivity<br>(Output/Input) |
|-----------|----------------------|---------------------|--------------------------------|
| Last Year | \$200,000            | \$35,000            | 5.71                           |
| This Year | \$220,000            | \$45,000            | 4.89                           |

*Partial Measure – Capital*

| Year      | Output<br>in Dollars | Input<br>in Dollars | Productivity<br>(Output/Input) |
|-----------|----------------------|---------------------|--------------------------------|
| Last Year | \$200,000            | \$50,000            | 4.00                           |
| This Year | \$220,000            | \$50,000            | 4.40                           |

*The overall productivity measure is declining, which indicates a possible problem. The partial measures can be used to indicate cause of the declining productivity. In this case, it is a combination of declines in both labor and raw material productivity, which were somewhat offset by an increase in the capital productivity. Further investigation should be undertaken to explain the drops in both labor and raw material productivity. An increase in the cost of both of these measures, without an accompanying increase in the selling price might explain these measures.*

20. An electronics company makes communications devices for military contracts. The company just completed two contracts. The navy contract was for 2,300 devices and took 25 workers two weeks (40 hours per week) to complete. The army contract was for 5,500 devices that were produced by 35 workers in three weeks. On which contract were the workers more productive?

| Contract | Output in Units | Input in Hours   | Productivity (Output/Input) |
|----------|-----------------|------------------|-----------------------------|
| Navy     | 2300            | $25(2)40 = 2000$ | 1.15                        |
| Army     | 5500            | $35(3)40 = 4200$ | 1.31                        |

*The workers were more productive on the Army contract.*

21. A retail store had sales of \$45,000 in April and \$56,000 in May. The store employs eight full-time workers who work a 40-hour week. In April the store also had seven part-time workers at 10 hours per week, and in May the store had nine part-timers at 15 hours per week (assume four weeks in each month). Using sales dollars as the measure of output, what is the percentage change in productivity from April to May?

| Month | Output in Dollars | Input in Hours           | Productivity (Output/Input) | Percentage Change              |
|-------|-------------------|--------------------------|-----------------------------|--------------------------------|
| April | \$45,000          | $(8(40)+7(10))*4 = 1560$ | 28.85                       |                                |
| May   | \$56,000          | 1820                     | 30.77                       | $(30.77-28.85)/28.85 = 6.66\%$ |

22. A parcel delivery company delivered 103,000 packages last year, when its average employment was 84 drivers. This year the firm handled 112,000 deliveries with 96 drivers. What was the percentage change in productivity over the two years?

| Year | Output in Packages | Input in Drivers | Productivity (Output/Input) | Percentage Change                     |
|------|--------------------|------------------|-----------------------------|---------------------------------------|
| Last | 103,000            | 84               | 1226.2                      |                                       |
| This | 112,000            | 96               | 1166.7                      | $(1166.7 - 1226.2)/1226.2 = - 4.85\%$ |

23. A fast-food restaurant serves hamburgers, cheeseburgers, and chicken sandwiches. The restaurant counts a cheeseburger as equivalent to 1.25 hamburgers and chicken sandwiches as 0.8 hamburger. Current employment is five full-time employees who each work a 40-hour week. If the restaurant sold 700 hamburgers, 900 cheeseburgers, and 500 chicken sandwiches in one week, what is its productivity? What would its productivity have been if it had sold the same number of sandwiches (2,100), but the mix was 700 of each type?

| Part                         | Output in Hamburger Equivalents | Input in Hours | Productivity (Output/Input) |
|------------------------------|---------------------------------|----------------|-----------------------------|
| 700 Hamburgers               |                                 |                |                             |
| 900 Cheeseburgers (1.25)     | 2225                            | 200            | 11.125                      |
| 500 Chicken Sandwiches (.80) |                                 |                |                             |
| 700 Hamburgers               |                                 |                |                             |
| 700 Cheeseburgers (1.25)     | 2135                            | 200            | 10.675                      |
| 700 Chicken Sandwiches (.80) |                                 |                |                             |

### Timbuk2<sup>1</sup>

You can have a lot of fun with this case. Start off by logging on to the Timbuk2 website and explore what is going on there. If you have a little money in a teaching account you might actually order a custom bag and give it away or raffle it off in class, this will really get their attention. You make a big deal of it all when the bag comes in and you give it to the lucky student. This also helps to reinforce the topic with the students.

1. Consider the two categories of products that Timbuk2 makes and sells. For the custom messenger bag, what are the key competitive dimensions that are driving sales? Are their competitive priorities different for the new laptop bags sourced in China?

This is one of the “other dimensions” and in this case it is the customization of the bag. Other than being able to get the colors they prefer, the customer also get pockets that meet the unique needs the customer has in mind. They can be successful with standardizing the laptop bags since the purpose here is pretty well defined.

2. Compare the assembly line in China to that in San Francisco along the following dimensions: (1) volume or rate of production, (2) required skill of the workers, (3) level of automation, and (4) amount of raw materials and finished goods inventory.

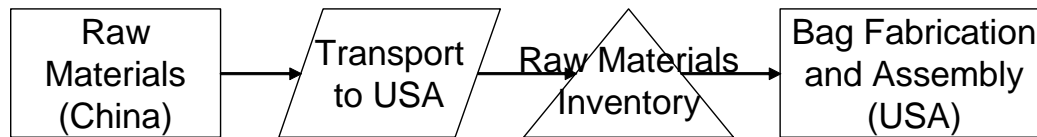
| Dimension                                 | China  | San Francisco                                   |
|---|--|---|
| Volume/rate of production                 | High   | Low   |
| Required skill of workers                 | Low  | High  |
| Level of automation                       | High   | Low   |
| Raw materials and finished good inventory | Low raw materials, but may have finished goods | High raw materials, virtually no finished goods |

3. Draw two diagrams, one depicting the supply chain for those products sourced in China and the other depicting the bags produced in San Francisco. Show all the major steps including raw material, manufacturing, finished goods, distribution inventory, and transportation. Other than manufacturing cost, what other costs should Timbuk2 consider when making the sourcing decision?

### Bag Fabrication and Assembly in China



### Bag Fabrication and Assembly in USA



The big cost other than manufacturing is the cost to transport material to the USA versus the cost of transporting the completed bags to the USA. Here we assume that the material would be sourced in China. This is probably not a bad assumption.