Solutions for Operations Management 13th Edition by Stevenson

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CHAPTER 02
COMPETITIVENESS, STRATEGY, AND PRODUCTIVITY

Teaching Notes

The topics covered in this chapter can be used to help get your course in OM off to an interesting start. Most of your students are aware that U.S. firms are having a difficult time competing with foreign firms in both the domestic and international markets. Many of them have grown up using products produced by foreign firms on an everyday basis and they have developed a great deal of respect for the quality of their products. Students are probably as familiar with names like Minolta, Honda, Toyota, Sony, BP Oil, Nestlé & BIC as they are with Ford, GM, GE, IBM, Texaco, Hershey, and Parker.

I think students will relate to the fact that companies must be productive to be competitive and that to be competitive they must have some well thought out approach, plan, or strategy on how to achieve this position. In other words, students will be able to understand why it is important to learn what productivity really is, how we measure it, what factors affect it, and how firms can improve their productivity. Students will become aware that business firms compete with each other in a variety of ways and will study the key competitive factors, which are of primary concern in today's global business environment. Finally, the students will focus on operations strategy with special attention being given to some of the newer strategies based on quality, time, and lean production systems.

Reading: Why Productivity Matters

1. Higher productivity relative to competitors is very important for a nation because it provides the nation with a competitive advantage in the marketplace. Productivity increases add value to the economy while controlling inflation. In addition, higher productivity provides the basis for a sustainable long-term growth in the economy. It allows companies to undercut competitors' prices to improve their market share or to realize higher profit margin at the same price level. Relative higher productivity also makes it more difficult for foreign companies to compete.

2. In general, service jobs have lower productivity than their manufacturing counterparts do because service productivity is very difficult to measure and, consequently, difficult to improve. In many cases, service jobs include intellectual activities and a high degree of variability, which makes productivity improvements difficult to achieve. Manufacturing jobs, on the other hand, lend themselves to productivity improvements mainly because they are able to utilize computer-based technology such as robotics to increase worker productivity.

3. Higher productivity allows companies to undercut competitors' prices to improve their market share, or to realize higher profit margin at the same price level. Relative higher productivity also makes it more difficult for foreign companies to enter a new market because it is difficult for them to compete against companies that have relatively higher productivity.

Reading: Dutch Tomato Growers Productivity Advantage

1. The factors that enable Dutch tomato growers to achieve much higher productivity than Italian and Greek growers include the following:

   Computerized, climate controlled greenhouses and soil spun from basalt and chalk that allow for precise control of humidity and nutrition and enable growers to produce their crops year round.

2. The Dutch growers' supply chain is an important factor because a Dutch trading company works closely with supermarket chains in Europe so that farmers are able to sell their output in high volume, which enables Dutch farmers to match supply and demand closely.

Answers to Discussion and Review Questions

1. They would be helpful in the sense that they would give U.S. manufacturers time to step up the use of industrial robots and other measures, which would make them better able to compete in domestic and world markets. The higher profits possible from reduced competition or higher prices on foreign cars could be used for research and development costs. Possible pitfalls include higher prices and less choice, which U.S. consumers would have to endure, and the possibility that U.S. companies would not use this as an opportunity to improve, but merely as a crutch. From the Japanese standpoint, they would be penalized for doing what many would see as a good job.

2. Business organizations compete with one another in a variety of ways. Key among these ways are price, quality, product differentiation, flexibility, and delivery time.

3. Characteristics such as price, quality, delivery speed, delivery reliability all can be order qualifiers or order winners. It is important to determine the set of order qualifier and order winner characteristics so that companies can emphasize or de-emphasize a given characteristic based on its classification of importance. Marketing must play a major role in determining order qualifiers and order winners. In classifying order winners and order qualifiers, marketing and operations must work together to match the market needs with the operational capability of the firm.

4. One store that many of us shop at is Wal-Mart. In the last decade, Wal-Mart has been growing steadily and gaining market share. There are numerous reasons why Wal-Mart has been successful in a very competitive market. Wal-Mart's ability to provide a very wide variety of goods with reasonable prices gives the company a competitive edge. Another reason involves the firm's ability to integrate various aspects of its operations with suppliers. In other words, successful supply chain management provides Wal-Mart with another competitive advantage.

   Many of us travel around the country and the world and stay at various hotels/motels. One of the hotel chains that has been successful is Super 8. The company is able to compete successfully because it is able to offer a safe, clean overnight stay at very reasonable prices in small markets. The specific tactics followed by the company are consistent with the basic niche that the company has carved out for itself.

5. The B alanced Scorecard is a top-down management system that helps managers focus attention on strategic issues related to finance, internal processes, customers, and learning and growth.

6. Strategy is the basic approach used by an organization to achieve its goal. Tactics are the methods and actions that are taken to accomplish strategies and carry out operations.

7. Organization strategy provides the overall direction for the organization and is broad in scope, e.g., low cost, scale-based strategies, specialization, newness, flexible operations, high quality, service, or sustainability. Operations strategy is narrower in scope, dealing primarily with the operations aspect of the organization. Operations strategy must be consistent with organization strategy and deals with products, processes, methods, operating resources, quality, costs, lead times, and scheduling.

8. Time-based strategies are approaches that focus on reducing the time needed to conduct the various activities in a process. The rationale is that by reducing time, costs are generally lower, productivity is higher, quality tends to be higher, product innovations appear on the market earlier, and customer service is improved. Examples of time-based strategies include reductions in any three of the following: planning time, product/service design time, processing time, changeover time, delivery time, or response time for complaints.

9. a. Productivity is the ratio of output to input.

   b. Productivity measures are used to judge the effective use of resources by countries, companies, and units within companies.

   c. High productivity rates relative to competitors can mean competitive advantages for companies. For countries, high productivity rates can reduce the risk of inflation and generate high standards of living for the country as a whole.

   d. Operations.

   e. Efficiency relates to a fixed set of tools or conditions. Productivity is wider in scope. Efficiency can be improved by better use of existing labor and equipment. Productivity can be improved by changing work methods, but also by changing equipment or conditions. The example of cutting grass with a pair of scissors is a good one: An efficiency approach would focus on the best way to use the scissors; a productivity approach would focus on use of a lawn mower. Note: Use of a mower, while more productive than the use of scissors, still may have room for improvement in its efficiency.

10. Factors affecting productivity include the following: Methods, capital, quality, technology, and management.

    Ways productivity can be improved include the following: Using productivity measures for all operations; eliminating bottlenecks; soliciting ideas from workers; forming work teams; studying other firms; reexamining work methods; establishing reasonable goals for improvement; obtaining support from management; measuring, rewarding, and publicizing improvements; and finally, not confusing productivity with efficiency because productivity is a much broader concept than efficiency is.

11. The Japanese worker is probably working smarter, if not harder, than U.S. workers are. By working smarter, we mean the Japanese are using more productive work methods than American workers are. One way that the Japanese accomplish this is by using time-based strategies that focus on reducing the time needed to accomplish various tasks. Some of the areas in which their organizations benefit from time reduction are planning time, design time, processing time, changeover time, delivery time, and response time for complaints.

12. It appears that Boeing can concentrate on selling its smaller airplanes in larger volumes to smaller airline companies. The advantage of producing smaller airplanes is the fact that Boeing can produce relatively large quantities at a lower cost. The disadvantage of producing smaller airplanes is that most likely, the profit margin is less and larger quantities must be sold to generate the same income as when smaller quantities of larger airplanes are produced. The advantage of producing larger airplanes is that most likely the profit margin is higher and the Airbus Company can afford to produce a smaller quantity of large airplanes to generate the same income as when larger quantities of smaller airplanes are produced by the rival company.

13. a. Interest rate on savings.

    b. Interest rate on checking and CDs.

c. Loan rates.

d. Quick loan application processing.

e. No fees or low fee values (free checking, no or low ATM fees).

f. Number of branches and locations to make it more convenient for the customers.

g. Free on-line banking.

h. Extended hours of service.

i. Extra services.

j. Lower minimum deposit before charging a service fee.

14. Technology usually works best when processing requirements are uniform. Therefore, reducing the variability provides more opportunities for implementing technology.

15. Answers will vary. Examples of companies with time based-strategies include fast-food restaurants, overnight package delivery companies, and universities offering undergraduate degrees in less time than the standard four years. Companies with quality-based strategies include high-end hotels, manufacturers of luxury automobiles, and high-end retailers.

Taking Stock

1. Top and senior management should be involved in formulating organizational strategy. However, the opinions of middle and lower management people should be sought in developing organizational strategy.

2. Competitive trade-offs that may arise in a fast-food restaurant include price vs. quality and cost vs. customer service. (If we have too few cashiers, customer waiting time will increase and subsequently the service level will decrease. On the other hand, if we have too many cashiers, the server idle time will increase, which in turn will result in unnecessarily high labor costs and lower productivity.)

3. a. Technology can improve competitiveness by improved product and service offerings, more efficient processing, a better Web site, more efficient order processing, better communication, easier and more effective coordination of supply chains, automatic billing, and automatic error checking.

   b. Computers and the related automation of various company or manufacturing functions and the Internet can assist in improving productivity by reducing processing time for activities.

Critical Thinking Exercises

1. The “productivity paradox” refers to massive investment in information technology that occurred in the latter part of the last century that did not appear to result in productivity gains. However, since that time, there have been consistent annual gains in productivity, perhaps due, in part, to the IT investments.

2. The automated processing would give a much higher labor productivity ratio than the manual processing would. We could use multifactor productivity as a more meaningful measure.

3. Focusing solely on efficiency may result in overlooking potential major productivity gains that could be achieved by altering inputs rather than simply refining methods to achieve relatively modest gains.

4. Although sending a note to Dom's boss might be perceived by some as disloyal, Sam would be doing the right thing for the rest of the employees. If Sam waits until Dom's unethical behavior is discovered, the result could be very negative for the rest of the employees.

5. Student answers will vary (see Chapter 1 for examples). Other examples could include any two of the following:

   a. Discontinuing safety training to save on training costs and boost the company's share price would violate the Utilitarian Principle due to the increased potential for worker accidents.

   b. Requiring buyers within a company to purchase materials illegally would violate the Rights Principle due to the unethical nature of the buying process imposed upon the buyers.

   c. Awarding a bid to a friend's company that was not the lowest cost bidder would violate the Fairness Principle due to the different standards applied to bidders.

   d. Refusing to invest in equipment to mitigate hazardous waste from an operations process would violate the Common Good Principle due to the risk of increased pollution in the community.

   e. A company's publicist making derogatory, false statements about a competitor's products would violate the Virtue Principle due to the lack of honesty in those statements.

Solutions

1. a. Anniversary = 300 / 8 = 37.5 meals/worker; Wedding = 240 / 6 = 40 meals/worker.
   b. Possible reasons are differences in the menu, number of courses, time of day, facilities, and worker skills/experience.

2.

Week	Crew Size	Yards Installed	Labor Productivity per Worker
1	4	96	24 yards
2	3	72	24
3	4	92	23
4	2	50	25
5	3	69	23
6	2	52	26

Notes:
Labor Productivity per Worker = Yards Installed / Crew Size

We can determine the Average Labor Productivity per Worker for each crew size as follows:

Crew Size of 2: (25 + 26) / 2 = 25.5
Crew Size of 3: (24 + 23) / 2 = 23.5
Crew Size of 4: (24 + 23) / 2 = 23.5

A crew size of 2 seems to work best with an Average Labor Productivity per Worker = 25.5 yards installed per worker.

3.

Week	Output	Number of Workers	Material (lbs.)	Labor Cost	Overhead Cost	Material Cost	Total Cost	MFP
1	30,000	6	450	2,880	4,320	2,700	9,900	3.03
2	33,600	7	470	3,360	5,040	2,820	11,220	2.99
3	32,200	7	460	3,360	5,040	2,760	11,160	2.89
4	35,400	8	480	3,840	5,760	2,880	12,480	2.84

Notes:
Labor Cost = Number of Workers x 40 hours x $12/hour
Overhead Cost = Labor Cost x 1.50
Material Cost = Material (lbs.) x $6/lb.
Total Cost = Labor Cost + Overhead Cost + Material Cost
Multifactor Productivity (MFP) = Output / Total Cost (rounded to two decimals)

Multifactor productivity dropped steadily from a high of 3.03 to a low of 2.84.

4. a. **Prior to Buying New Equipment:**
Labor Productivity = Carts per Worker per Hour = 80 / 5 = 16 Carts per Worker per Hour.

After Buying New Equipment:
Labor Productivity = Carts per Worker per Hour = (80 + 4) / (5 – 1) = 84 / 4 = 21 Carts per Worker per Hour.

b. **Prior to Buying New Equipment:**
Multifactor Productivity = Carts per Dollar (Labor + Equipment)
Labor = 5 workers x $10/hour = $50/hour
Equipment = Machine Cost = $40/hour
Multifactor Productivity = 80 carts / ($50 + $40) = 0.89 Carts per Dollar (rounded to two decimals)

After Buying New Equipment:
Multifactor Productivity = Carts per Dollar (Labor + Equipment)
Labor = 4 workers x $10/hour = $40/hour
Equipment = Machine Cost = $40/hour + $10/hour = $50/hour
Multifactor Productivity = 84 carts / ($40 + $50) = 0.93 Carts per Dollar (rounded to two decimals)

c. $$Labor\ Productivity\ Growth = \frac{Current\ productivity - Previous\ productivity}{Previous\ productivity} x100$$

$$= \frac{21-16}{16} x100 = \frac{5}{16} x100 = 31.25\% \ (rounded\ to\ two\ decimals)$$

$$MFP\ Growth = \frac{Current\ productivity - Previous\ productivity}{Previous\ productivity} x100$$
$$= \frac{0.93-0.89}{0.89} x100 = \frac{0.04}{0.89} x100$$
$$= 4.49\% \ (rounded\ to\ two\ decimals)$$
$$* Excel\ may\ show\ a\ rounded\ number\ of\ 5\%$$

5. **With Scrap Rate of 10%:**

Amount of Good Product Produced = Amount In x (1 – Scrap Rate)

Re-arranging terms:

Amount In = Amount of Good Product Produced / (1 – Scrap Rate)

Amount In = 72 pieces per hour / (1 – 0.10) = 72 pieces per hour / (0.90) =

80 pieces per hour.

Without Scrap:

The output could be 80 pieces per hour.

The increase in productivity would be 80 – 72 = 8 pieces per hour.

This would amount to a % productivity increase of: (80 – 72) / 72 = 11.11% (rounded to two decimals).

6. Current period productivity = $\frac{160\,units}{40\,hours} = 4.00\,units/hour$ (rounded to two decimals)

Previous period productivity = $\frac{138\,units}{36\,hours} = 3.83\,units/hour$ (rounded to two decimals)

$$Productivity\ Growth = \frac{Current\ productivity - Previous\ productivity}{Previous\ productivity} x100$$
$$= \frac{4.00-3.83}{3.83} x100 = 4.44\%$$

Thus, there was an increase of 4.44% in productivity (rounded to two decimals).

7. a. Labor Productivity and Multifactor Productivity for Each Unit

Unit	Employees	Customers per Day	Labor Cost	Overhead Cost	Material Cost	Total Cost	Labor Productivity	MFP (2 decimals)	MFP (3 decimals)
A	4	36	800	800	180	1,780	9.00	0.02	0.020
B	5	40	1,000	1,000	200	2,200	8.00	0.02	0.018
C	8	60	1,600	1,600	300	3,500	7.50	0.02	0.017

D	3	20	600	600	100	1,300	6.67	0.02	0.015

Notes:
Labor Cost = Employees x 8 hours x $25/hour
Overhead Cost = Labor Cost x 1.00
Material Cost = Customers x $5/customer
Total Cost = Labor Cost + Overhead Cost + Material Cost
Labor Productivity = Customers per Day / Employees (rounded to two decimals)
Multifactor Productivity (MFP) = Output / Total Cost (shown rounded to two decimals & three decimals above)

b. Labor Productivity and Multifactor Productivity for Each Unit (each employee is able to process one additional customer per day)

Unit	Employees	Customers per Day	Labor Cost	Overhead Cost	Material Cost	Total Cost	Labor Productivity	MFP (2 decimals)	MFP (3 decimals)
A	4	40	800	800	200	1,800	10.00	0.02	0.022
B	5	45	1,000	1,000	225	2,225	9.00	0.02	0.020
C	8	68	1,600	1,600	340	3,540	8.50	0.02	0.019
D	3	23	600	600	115	1,315	7.67	0.02	0.017

Notes:
Customers per Day = Original Customers per Day from part a above + (Employees x 1 Additional Customer per Day)
Labor Cost = Employees x 8 hours x $25/hour
Overhead Cost = Labor Cost x 1.00
Material Cost = Customers x $5/customer
Total Cost = Labor Cost + Overhead Cost + Material Cost
Labor Productivity = Customers per Day / Employees (rounded to two decimals)
Multifactor Productivity (MFP) = Output / Total Cost (shown rounded to two decimals & three decimals above)

8.

Search Approach	Search Average Time (min.)	Cost per Search	Output ($)	Productivity per Dollar Input
Current	40	40 min. x $2/min. = $80	$400	$400/$80 = $5.00
Company A	30 (40 – 10)	(30 min x $2/min.) + $3.50/search = $63.50	$400	$400/$63.50 = $6.30
Company B	28 (40 – 12)	(28 min. x $2/min.) + $3.60/search = $59.60	$400	$400/$59.60 = $6.71

Notes:
This problem expresses the output in terms of standard price rather than in units.

9. Number of employees = 3.
Each employee earns $25/hour and works 40 hours/week.
Each employee identifies an average of 3,000 leads per week.
The sign-up rate is 4% of the leads identified.
Revenue per sign-up = $70.
Material costs = $1,000 per week.
Overhead costs = $9,000 per week.

Multifactor Productivity = Fees generated per dollar of input

$$MFP = \frac{3{,}000\ leads/employee\ x\ 3\ employees\ x\ .04\ signups/lead\ x\ \$70/signup}{(3\ employees\ x\ 40\ hours/employee\ x\ \$25/hour) + \$1{,}000 + \$9{,}000}$$

$$MFP = \frac{\$25{,}200}{\$13{,}000} = 1.94$$

Multifactor Productivity = 1.94 (rounded to two decimals)

Case: An American Tragedy; How a Good Company Died

1. Internal reasons for Burgmaster's demise include the following: The LBO crippled the company with debt and created pressure to generate cash. Burgmaster's managers responded by pushing products out as fast as possible, thereby routinely shipping defective machines. In addition, Burgmaster promised customers features that engineers had not designed yet. In addition, the LBO choked off funds needed for new equipment. Burgmaster's scheduling system was too crude for complex machine-tool manufacturing—this resulted in supply errors that resulted in delays and cost increases. After the LBO, management appeared to be less involved on the shop floor also—this led to complacency.

   External reasons for Burgmaster's demise include the following: Japanese producers started making and selling better, cheaper machines. Government policy (tax laws and macroeconomic policies) encouraged LBOs and speculation instead of productive investment. In addition, President Reagan refused to sign legislation to withhold the investment tax credit for certain Japanese-made machine tools. Finally, Pentagon procurement policies favored exotic, custom machines over standard, low-cost models (the low-cost models were manufactured by Burgmaster).

   Operations management (OM) played a significant role in the company's demise: The OM function knowingly shipped defective products, which harmed sales. Someone in OM decided to implement a scheduling system that did not function well and led to delays and increased costs. Even without investment, the OM manager could have made low-cost, continuous improvements in the manufacturing process.

2. Inadequate strategic planning could have been a factor for the company. If the company had been conducting environmental scans periodically, they may have been able to plan for the issues that ultimately caused the failure of the company.

3. One possible strategy would have been to have a person who had extensive experience in the field, and a background in operations, run the company. This would have alleviated some of the production issues, and possibly could have made the company more competitive. Another possible strategy would have been to seek government help more aggressively to level the playing field.

Case: Home-Style Cookies

1. A batch process is used. A worker checks the master list for ingredients, and enters that information into the computer. The computer determines ingredient quantities, and then automatically orders the ingredients, which are automatically sent to mixing machines. After mixing, the batter is poured into a cutting machine. Individual cookies are then dropped onto a continuous band and transported through an oven. Filled cookies require an extra step. After baking, cookies are cooled on a spiral cooling rack. Cookies are inspected, defectives are removed, and the remaining cookies are packaged and labeled.
2. Productivity was increased by the following: Using a computer to determine the amounts of ingredients needed, by cutting cookies diagonally to reduce the space required, by increasing the length of each oven by 25 feet, by baking cookies in a sequence that minimizes downtime for cleaning, by using broken cookies in the oatmeal cookies, and by reclaiming heat from the ovens to heat the building. The company recently increased the length of its ovens so that more cookies can be baked at the same time.
3. All companies have a moral obligation to their employees. Small companies with local owners, particularly in a small community, are more likely to be influenced by such considerations than large companies, in large communities, are. The issue is a difficult one, often without easy solutions. Cost and efficiency may favor layoffs, but ill will and the effects on morale of employees who remain are important considerations.
4. Freshness of cookies, frequent changes of label requirements, and baking to customer order are factors that favor minimal inventories. Benefits include lower inventory costs, satisfied customers (due to freshness of product), and less need for storage space.
5. Freshness, list of ingredients, packaging/display, appearance of product (size, shape, color), taste are potential factors when judging the quality of cookies.
6. Because the cookies do not use preservatives, the product probably appeals to health-conscious buyers, and there are fewer ingredients to purchase, store, and mix. However, without preservatives, the shelf life of the cookies is limited.
7. The company's strategy is to provide a high quality ("good food") cookie that appeals to a particular market niche.

Case: Hazel Revisited

1. Her customers are her neighbors and friends. She has had personal relationships with many of her customers for years and they are going to want to help her as long as she does a good job.
2. a. By increasing her productivity, Hazel can mow more lawns over a given length of time (day, week and/or month) and increase her total revenue. Hence, if she maintains her present cost structure per lawn, she will increase profits.

   b. By improving her mowing technique.

   By investing in equipment that is more productive.

By experimenting with different crew sizes to find the most productive combination or division of labor.

3. She should consider time, cost and competition.

4. The advantages would be greater market share, higher sales opportunity, economies of scale, and higher utilization of the equipment. The disadvantages of expanding include additional transportation time and cost, increased wear and tear on the equipment, and it may be more difficult for her to compete outside of her own neighborhood where she is already known.

5. a. There will be many people who would defend this statement and many small businesses are successful without mission statements and objectives. However, it is difficult to project how much improvement could be made if they did have mission statements and objectives and used them to provide better direction, guidance, and focus. Short-run results may not be apparent, but over a longer period, gradual and subtler improvements may become noticeable and even dramatic improvements can take place in the end.

   b. The development of the mission statement would force Hazel to sit down and spend some time determining what business she is in or wants to be in and her business' reason for existence. This process also should help Hazel develop a clear statement of purpose, which should serve as a guide in determining what she wants to accomplish in terms of goals and objectives for her business. From here, Hazel should find it easier to develop her strategy and plan how she is going to achieve her goals and objectives. This process will also assist her in gaining the proper focus for making decisions.

   c. Many people have the false impression that mission statements and goal setting are only for large organizations when the facts show that many small businesses fail because they really do not know in what business they are. Strategic planning on how to accomplish goals and objectives is just as important for the small business as it is for the large one and it is extremely important for the new small business, which desperately needs direction and guidance in the beginning.

Case: Your Garden Gloves

1. We are given the following:

Crew Size	Average Productivity per Crew
2	4,234 square feet per day
3	5,352 square feet per day
4	7,860 square feet per day

We need to determine the productivity per worker using the following formula:

$$\frac{Average\ Productivity\ per\ Crew}{Crew\ Size}$$

Crew Size	Average Productivity per Crew	Productivity per Worker
2	4,234 square feet per day	4,234 / 2 = 2,117 square feet per day
3	5,352 square feet per day	5,352 / 3 = 1,784 square feet per day
4	7,860 square feet per day	7,860 / 4 = 1,965 square feet per day

The crew size of 2 had the highest productivity. The crew size of 3 had the lowest productivity.

The crew size of 4 was in the middle.

One reason for the difference in productivity between a crew size of 2 and a crew size of 3 could be that when 3 workers are assigned to a small job, workers may be getting in the way of each other, which could cause wait time. A second reason could be that the larger crew size may lead to more standing around and talking. A third reason might be that workers are more productive when working in pairs.

A possible reason for the difference in productivity between a crew size of 2 and a crew size of 4 could be that when 4 workers are assigned to a large job, workers still may be getting in the way of each other, which would cause wait time. In addition, 4 workers will have more interaction, standing around, etc.

2. Even though the productivity of 4 was not the highest, the total time to complete the cleanup would still be less than if only a crew of 2 were to be used. In addition, the owner may have wanted to impress the customer by using a larger crew.
3. Perhaps the size of the crew is not as influential in regards to productivity levels as is the composition of the crew. One area that the productivity ratios fail to accommodate for is team synergy.

Operations Tour: The U.S. Postal Service

1. The U.S. Postal Service is a very large organization and processes a large volume of mail using very expensive sorting, scanning, and barcoding equipment. Because this equipment is designed to process very large volumes of mail, if the Postal System does not have large volumes of mail to process, its productivity will decline.
2. The new automated processing equipment, optical readers, and barcode readers resulted in improvements in productivity. In addition, reorganization efforts, which included elimination of layers of management, overhead positions, and certain programs resulted in significant cost reductions, which also contributed to the improvement of productivity.
3. Competition from other methods of delivering information has caused the USPS to rethink their market. In addition, with added competition from UPS and FedEx, USPS will have to reestablish what they do best. Delivery companies such as FedEx and UPS that offer speedy delivery and package tracking gave businesses and individual customers an alternative besides the U.S. Postal Service. In addition, electronic communication, e-mails, and fax machines provided alternative means of communication for individuals and businesses that reduced U.S. Postal System's demand. Instead of direct-mail advertising, many companies began to use cable TV advertising because cable TV advertising had become more affordable for small and medium size companies.
4. The U.S. Postal Service developed the following strategies to become more competitive against the new threats it was facing:
    a. Reorganization—elimination of layers of management and overhead positions, elimination of certain programs.
    b. Seeking ways to reduce costs and eliminate waste.
    c. Emphasizing quality, customer service, and customer convenience.

5. The USPS's changes resulted in the following: Costs were cut because layers of management were eliminated and overhead positions were cut by about 30,000. Processing and mail delivery at major postal facilities were improved. Expanded retail hours, a more user-friendly Domestic Manual, and new services to meet specific mailer needs attracted new customers. The result was a reduction in USPS's projected deficit. It appears (based on the January 2012 OMB Scorecard on Sustainability/Energy) that USPS may have cut costs associated from reduced water and energy usage due to sustainability initiatives also.

6. The increased use of e-mail will result in reduction of using traditional mailing, which in turn will reduce the demand for the U.S. Postal System, resulting in a possible decline in its productivity.

7. The use of standard shipping containers and flat-rate mailers helped the U.S. Postal System meet specific mailer needs and to simplify its complex rate structure.

Chapter 2
BusinessWriting Exercises

1. Last year, your company initiated a major effort to improve productivity throughout the company. During the first few months, little improvement was made. Recently, however, major gains, exceeding 20 percent, have been made in both the packaging and equipment repair departments. You would like to commend them for their achievements, and announce to the other departments that gains are possible. You are also aware that some production employees believe that significant gains in productivity means the loss of some jobs because the company will be able to achieve the same output with fewer employees. Another local company laid off 5 percent of its workforce shortly after announcing productivity gains. Nonetheless, you believe that by achieving even modest productivity gains, your company will become more competitive and therefore be able to capture a larger share of the market. You believe that increased demand will more than offset productivity gains, and may even require hiring more employees. Naturally, you cannot guarantee this, although you are optimistic about the chances that this will occur.
Compose an email to employees that covers these points.

2. Assume the role of vice president of manufacturing of Eastern Products, Philadelphia. You are thinking about the forthcoming annual retreat of top-level managers of manufacturing, engineering, marketing, and product design to discuss strategic planning. Competitive pressures from several domestic and foreign companies give this year's meeting special significance, and you want to arrange for a truly productive session.
In the past, some meetings haven't been as successful as you would have liked. You learned from experience that holding the meeting at corporate headquarters didn't work because the managers were too accessible to their subordinates. It's much better if the group can meet away from home territory, allowing them the opportunity to concentrate and develop camaraderie. You also found that traditional vacation spots are not conducive to achieving the best results. You want your administrative assistant to investigate agencies that specialize in business retreats. Twelve to 14 people will attend the conference. Each will require a separate hotel room. Exercise facilities should be on the premises. Audiovisual support will be needed for video presentations, and overhead projectors and flip charts also will be needed. Light lunches should be arranged. You need to get dietary preferences from those attending. The location for the annual retreat should not require excessive travel costs or travel time. Arrangements must be completed within two weeks.

Compose an email outlining these requirements to your assistant, Armin Joseph. It is his task to investigate possible retreat locations and make all the arrangements.

Chapter 2

Competitiveness, Strategy, and Productivity

Chapter 2: Learning Objectives

You should be able to:

LO 2.1 List several ways that business organizations compete

LO 2.2 Name several reasons that business organizations fail

LO 2.3 Define the terms *mission* and *strategy* and explain why they are important

LO 2.4 Discuss and compare organization strategy and operations strategy, and explain why it is important to link the two

LO 2.5 Describe and give examples of *time-based* strategies

LO 2.6 Define the term *productivity* and explain why it is important to organizations and to countries

LO 2.7 Describe several factors that affect productivity

A Cold Hard Fact

Better quality, higher productivity, lower costs, and the ability to respond quickly to customer needs are more important than ever, and…

the bar is getting higher

LO 2.1

Chapter Focus

- This chapter focuses on three separate, but related ideas that are vitally important to business organizations
  - Competitiveness
  - Strategy
  - Productivity

LO 2.1

Competitiveness

- **Competitiveness:**
  - How effectively an organization meets the wants and needs of customers relative to others that offer similar goods or services
  - Organizations compete through some combination of their marketing and operations functions
    - What do customers want?
    - How can these customer needs best be satisfied?

Marketing's Influence

- Identifying consumer wants and/or needs
- Pricing and quality
- Advertising and promotion

Businesses Compete Using Operations

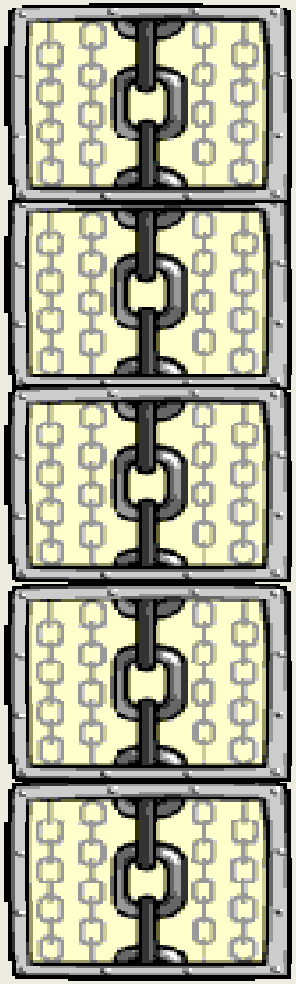
1. Product and service design
2. Cost
3. Location
4. Quality
5. Quick response
6. Flexibility
7. Inventory management
8. Supply chain management
9. Service
10. Managers and workers

LO 2.1

Why Some Organizations Fail

1. Neglecting operations strategy
2. Failing to take advantage of strengths and opportunities and/or failing to recognize competitive threats
3. Too much emphasis on short-term financial performance at the expense of R&D
4. Too much emphasis in product and service design and not enough on process design and improvement
5. Neglecting investments in capital and human resources
6. Failing to establish good internal communications and cooperation
7. Failing to consider customer wants and needs

Hierarchical Planning



Mission

Goals

Organizational strategies

Functional strategies

Tactics

LO 2.3

Mission, Goals, and Strategy

- **Mission**
  - The reason for an organization's existence
  - It answers the question "What business are we in?"
- **Goals**
  - Provide detail and the scope of the mission
    - Goals can be viewed as organizational destinations
- **Strategy**
  - A plan for achieving organizational goals
    - Serves as a roadmap for reaching the organizational destinations
  - The organizational strategy guides the organization by providing direction for, and alignment of, the goals and strategies of the functional units
  - The organizational strategy is a major success/failure factor

LO 2.3

Mission

- **Mission**
  - The reason for an organization's existence
- **Mission statement**
  - States the purpose of the organization
  - The mission statement should answer the question of "What business are we in?"

FedEx Mission Statement

- FedEx Corporation will produce superior financial returns for its shareowners by providing high value-added logistics, transportation and related information services through focused operating companies. Customer requirements will be met in the highest quality manner appropriate to each market segment served. FedEx Corporation will strive to develop mutually rewarding relationships with its employees, partners and suppliers. Safety will be the first consideration in all operations. Corporate activities will be conducted to the highest ethical and professional standards.

Goals

- **The mission statement serves as the basis for organizational goals**
- **Goals**
  - Provide detail and the scope of the mission
    - Goals can be viewed as organizational destinations
  - Goals serve as the basis for organizational strategies

Strategies

- **Strategy**
  - A plan for achieving organizational goals
    - Serves as a roadmap for reaching the organizational destinations
  - Organizations have
    - *Organizational strategies*
      - Overall strategies that relate to the entire organization
      - Support the achievement of organizational goals and mission
    - *Functional level strategies*
      - Strategies that relate to each of the functional areas and that support achievement of the organizational strategy

Tactics and Operations

- **Tactics**
  - The methods and actions taken to accomplish strategies
  - The "how to" part of the process
- **Operations**
  - The actual "doing" part of the process

Core Competencies

- **Core competencies**

  The special attributes or abilities that give an organization a *competitive edge*

  - To be effective core competencies and strategies need to be aligned

Sample Operations Strategies

Organizational Strategy	Operations Strategy	Examples of Companies or Services
Low Price	Low cost	U.S. first-class postage
		Wal-Mart
Responsiveness	Short processing times	McDonald's restaurants
	On-time delivery	FedEx
Differentiation: High Quality	High performance design and/or high quality processing	Sony TV
	Consistent quality	Coca-Cola
Differentiation: Newness	Innovation	3M, Apple
Differentiation: Variety	Flexibility	Burger King (Have it your way")
	Volume	McDonald's ("Buses Welcome")
Differentiation: Service	Superior customer service	Disneyland
		IBM
Differentiation: Location	Convenience	Supermarkets; mall stores

LO 2.4

Strategy Formulation

- Effective strategy formulation requires taking into account:
  - Core competencies
  - Environmental scanning
    - SWOT
- Successful strategy formulation also requires taking into account:
  - Order qualifiers
  - Order winners

Strategy Formulation (cont.)

- **Order qualifiers**
  - Characteristics that customers perceive as minimum standards of acceptability for a product or service to be considered as a potential for purchase
- **Order winners**
  - Characteristics of an organization's goods or services that cause it to be perceived as better than the competition

LO 2.4

Environmental Scanning

- **Environmental scanning is necessary to identify**
  - Internal factors
    - Strengths and weaknesses
  - External factors
    - Opportunities and threats

Key External Factors

1. Economic conditions
2. Political conditions
3. Legal environment
4. Technology
5. Competition
6. Markets

Key Internal Factors

1. Human resources
2. Facilities and equipment
3. Financial resources
4. Customers
5. Products and services
6. Technology
7. Suppliers
8. Other

Operations Strategy

- **Operations strategy**
  - The approach, consistent with organization strategy, that is used to guide the operations function

LO 2.4

Strategic OM Decision Areas

Decision Area	What the Decisions Affect
Product and service design	Costs, quality, liability, and environmental issues
Capacity	Cost, structure, flexibility
Process selection and layout	Costs, flexibility, skill level needed, capacity
Work design	Quality of work life, employee safety, productivity
Location	Costs, visibility
Quality	Ability to meet or exceed customer expectations
Inventory	Costs, shortages
Maintenance	Costs, equipment reliability, productivity
Scheduling	Flexibility, efficiency
Supply chains	Costs, quality, agility, shortages, vendor relations
Projects	Costs, new products, services, or operating systems

LO 2.4

Quality-Based Strategies

- **Quality-based strategy**
  - Strategy that focuses on quality in all phases of an organization
    - Pursuit of such a strategy is rooted in a number of factors:
      - Trying to overcome a poor quality reputation
      - Desire to maintain a quality image
      - A desire to catch up with the competition
      - A part of a cost reduction strategy

Time-Based Strategies

- **Time-based strategies**
  - Strategies that focus on the reduction of time needed to accomplish tasks
    - It is believed that by reducing time, costs are lower, quality is higher, productivity is higher, time-to-market is faster, and customer service is improved

Time-Based Strategies (cont.)

- **Areas where organizations have achieved time reductions:**
  - Planning time
  - Product/service design time
  - Processing time
  - Changeover time
  - Delivery time
  - Response time for complaints

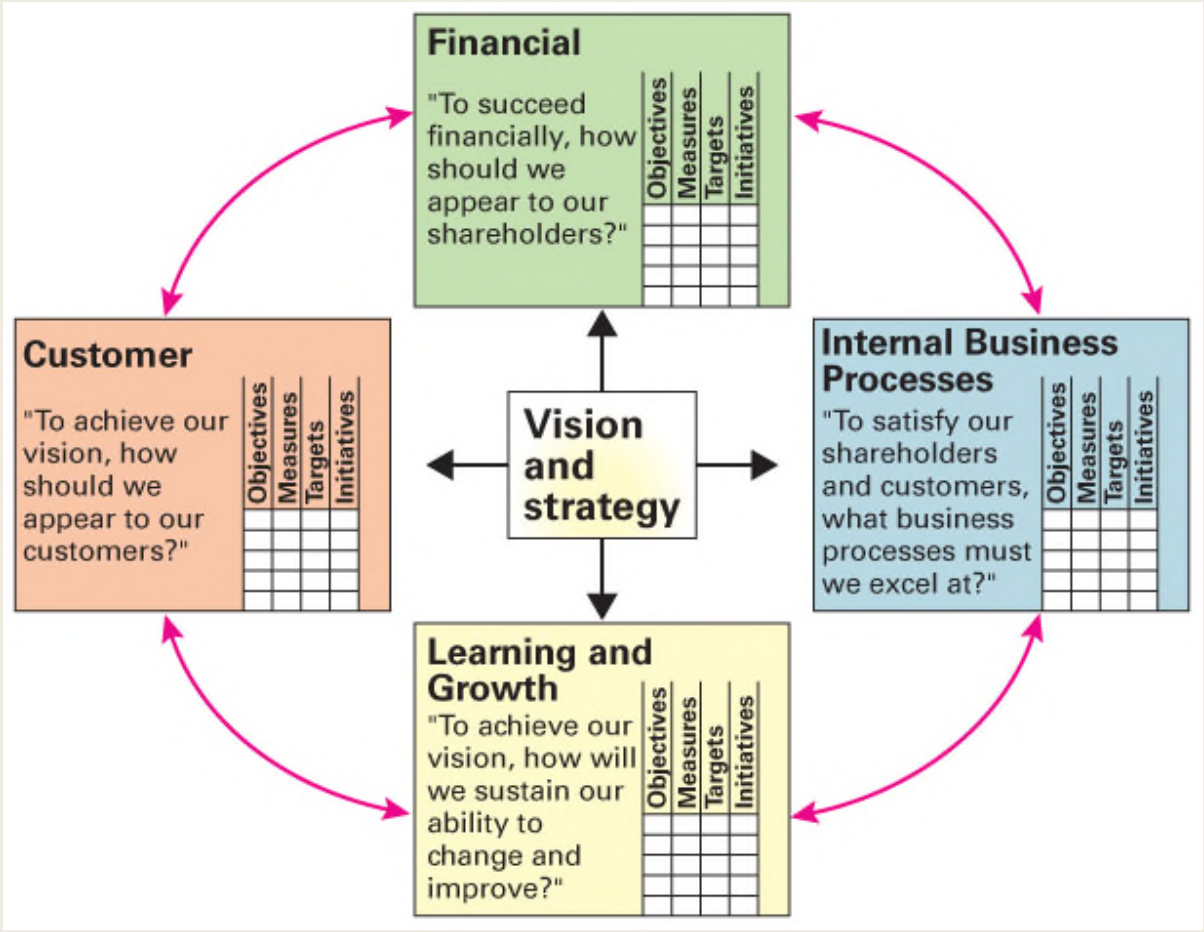
Agile Operations

- **Agile operations**
  - A strategic approach for competitive advantage that emphasizes the use of flexibility to adapt and prosper in an environment of change
    - Involves the blending of several core competencies:
      - Cost
      - Quality
      - Reliability
      - Flexibility

The Balanced Scorecard Approach

- **A top-down *management system* that organizations can use to clarify their vision and strategy and transform them into action**
  - Develop objectives
  - Develop metrics and targets for each objective
  - Develop initiatives to achieve objectives
  - Identify links among the various perspectives
    - Finance
    - Customer
    - Internal business processes
    - Learning and growth
  - Monitor results

The Balanced Scorecard



Productivity

- **Productivity**
  - A measure of the effective use of resources, usually expressed as the ratio of output to input
- **Productivity measures are useful for**
  - Tracking an operating unit's performance over time
  - Judging the performance of an entire industry or country

Why Productivity Matters

- High productivity is linked to higher standards of living
  - As an economy replaces manufacturing jobs with lower productivity service jobs, it is more difficult to maintain high standards of living
- Higher productivity relative to the competition leads to competitive advantage in the marketplace
  - Pricing and profit effects
- For an industry, high relative productivity makes it less likely it will be supplanted by foreign industry

Productivity Measures

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

$$\text{Partial Measures} \quad \frac{\text{Output}}{\text{Single Input}}; \quad \frac{\text{Ouput}}{\text{Labor}}; \quad \frac{\text{Output}}{\text{Capital}}$$

$$\text{Multifactor Measures} \quad \frac{\text{Output}}{\text{Multiple Inputs}}; \quad \frac{\text{Ouput}}{\text{Labor} + \text{Machine}}; \quad \frac{\text{Output}}{\text{Labor} + \text{Capital} + \text{Energy}}$$

$$\text{Total Measure} \quad \frac{\text{Goods or services produced}}{\text{All inputs used to produce them}}$$

LO 2.6

Productivity Calculation Example

Units produced:	5,000
Standard price:	$30/unit
Labor input:	500 hours
Cost of labor:	$25/hour
Cost of materials:	$5,000
Cost of overhead:	2x labor cost

What is the multifactor productivity?

Solution

$$\text{Multifactor Productivity} = \frac{\text{Output}}{\text{Labor} + \text{Material} + \text{Overhead}}$$

$$= \frac{5{,}000 \text{ units} \times \$30/\text{unit}}{(500 \text{ hours} \times \$25/\text{hour}) + \$5{,}000 + (2(500 \text{ hours} \times \$25/\text{hour}))}$$

$$= \frac{\$150{,}000}{\$42{,}500}$$

$$= 3.5294$$

What is the implication of an unitless measure of productivity?

LO 2.6

Productivity Growth

$$\text{Productivity Growth} = \frac{\text{Current productivity} - \text{Previous productivity}}{\text{Previous productivity}} \times 100\%$$

Example: Labor productivity on the ABC assembly line was 25 units per hour in 2014. In 2015, labor productivity was 23 units per hour. What was the productivity growth from 2014 to 2015?

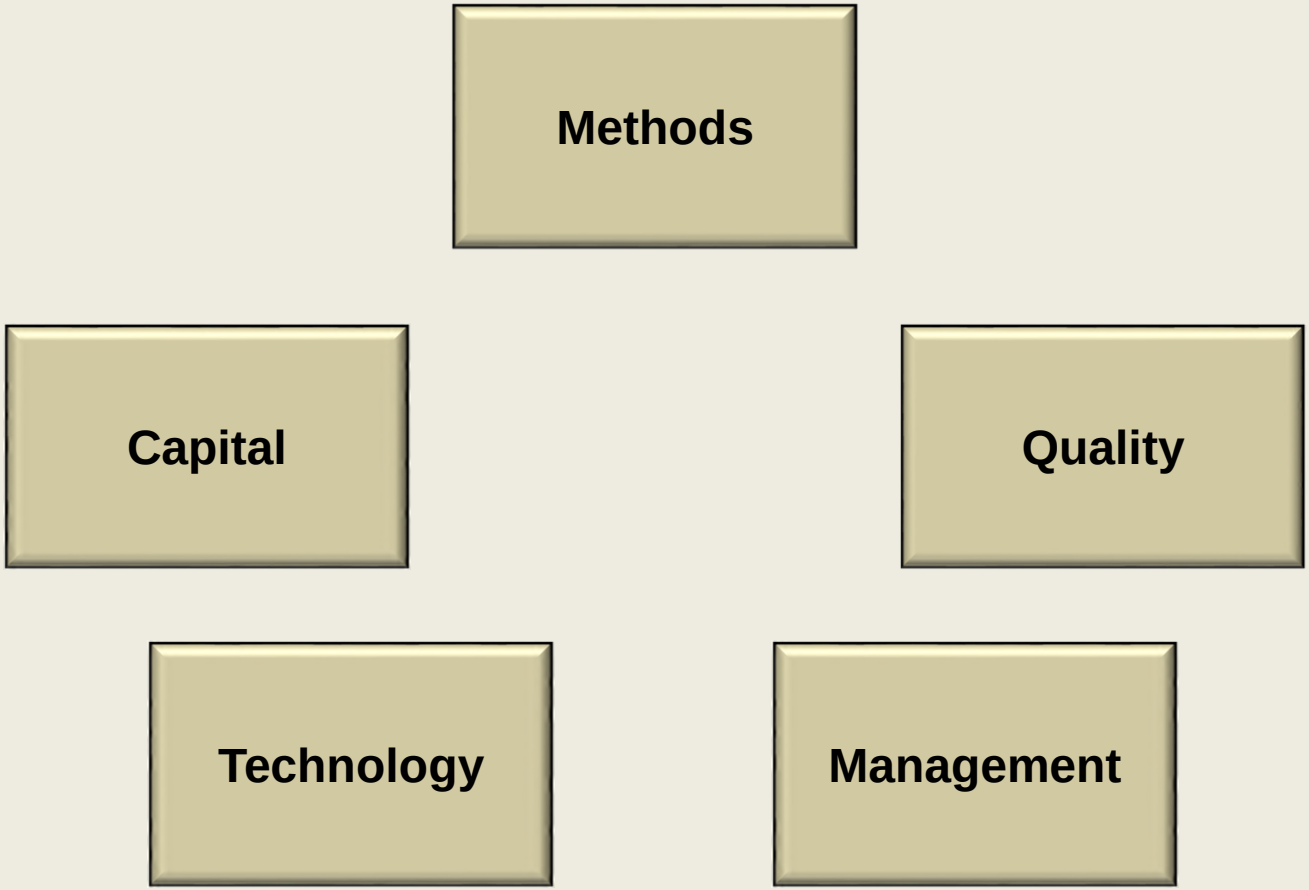
$$\text{Productivity Growth} = \frac{23 - 25}{25} \times 100\% = -8\%$$

LO 2.6

Service Sector Productivity

- Service sector productivity is difficult to measure and manage because
  - It involves intellectual activities
  - It has a high degree of variability
- A useful measure related to productivity is ***process yield***
  - Where products are involved
    - Ratio of output of good product to the quantity of raw material input
  - Where services are involved, process yield measurement is often dependent on the particular process:
    - Ratio of cars rented to cars available for a given day
    - Ratio of student acceptances to the total number of students approved for admission

Factors Affecting Productivity



LO 2.7

Improving Productivity

1. Develop productivity measures for all operations
2. Determine critical (bottleneck) operations
3. Develop methods for productivity improvements
4. Establish reasonable goals
5. Make it clear that management supports and encourages productivity improvement
6. Measure and publicize improvements
7. Don't confuse *productivity* with *efficiency*

LO 2.7