

Chapter

1

Using Operations to Create Value

DISCUSSION QUESTIONS

1. Answering this question demonstrates that processes underlie all of our jobs. What might be surprising is how many students would put their job in the category of “other,” suggesting that many jobs do not fall neatly into any one functional area. Perhaps many in the “other” category might best be called “operations” on further reflection. Customers, both internal and external, are part of each process, and the goal is to manage the processes to add the most value for them.
2. Amazon.com offers a very broad range of services and products at competitive prices. Its competitive priorities would include fast delivery time, on-time delivery, customization, variety and low-cost operations. As a business, Amazon.com is actually assembling a customized basket of goods that must be delivered in a short window of time in a dependable fashion. Low-cost operations are needed to remain competitive. To remain in business, Amazon.com needs to maintain high volumes of traffic. Operations strategy must focus on stock availability and quick, economical, and dependable delivery.
3. The hospital’s commitment *to provide attention to patients arriving to the emergency unit in less than 15 minutes and never to turn away patients who need to be hospitalized* implies that the facility must be designed to have extra capacity in both beds and emergency room facilities. It must plan on having extra personnel in the emergency room and also plan on having additional emergency personnel on call to take care of unprecedented heavy loads. In line with the mission statement, maximum utilization of the facilities (i.e., beds and emergency room personnel) would not be one of the performance objectives for the hospital.
4. FedEx traditionally has competed on the basis of fast, dependable delivery. Before the boom in Internet applications, many businesses relied on FedEx to get things to other businesses overnight. Now, this need is beginning to diminish as sophisticated systems are being installed to assist companies in planning operations better. And, the Internet based companies are adding more demands for low cost ground deliveries to specific customer doors. FedEx, in order to remain competitive with companies such as UPS, has moved into the door-to-door delivery business, perhaps through acquisition. Nonetheless, it will require changes to this company’s competitive priorities.
5. Technology Management. To identify a market segment, we need to determine answers to questions such as: Which colleges and departments currently offer the subject? What do instructors desire in the way of textbook support? Is there a trend toward Technology Management courses? Are there other Technology Management

texts? Some needs assessment can be accomplished by survey, but the response rate may be low. A high-investment strategy would be to ask or hire instructors to review and critique a list of topics, then an outline, then a draft. Explicit services include supplying information about the subject in the form of a textbook and instructor support in the form of ancillary publications.

6. It is often not a good idea for a company to try to excel in all of the competitive priorities because it is generally impossible to do so. Mediocrity is a predictable result. The choice and the minimum level of one or more of the competitive priorities are set by the order qualifiers for the particular product or service. The choice of the competitive priorities that the company should emphasize is usually governed by the company's strategy driven by its mission statement and the core competencies that the company wants to harness to seek the best competitive advantage.
7. Core processes should link to a firm's core competencies. Core processes are those processes that provide the firm the best competitive advantage. Essential to the definition a firm's core processes is the concept of "interaction costs." These costs include the time and money that are expended whenever people and companies exchange services, products, or ideas. If the transaction costs are higher to retain a process within the firm's organization than to outsource the process, the process should be outsourced.
8. Wendy's assembles hamburgers to order. When materials are held at the stage just before final assembly, they can be used to complete a wide variety of different sandwiches. Because no finished-goods stock exists, when customers say, "Hold the sauce," there is no delay or waste of materials. Service clerks specialize. One clerk takes orders and payment. Others fill portions of the order. Orders are processed in single file. Throughput is normally restricted by transactions at the cash register. At busy times, throughput is increased by splitting the bottleneck operation. One clerk takes customer orders, another receives payment. The Wendy's operation has some characteristics of assembly. Therefore, the impact of new menu items on the production operations must be carefully considered.
9. Grandmother's Chicken.
 - a. Kathryn Shoemaker's strategic plans include the following:
 - Product and service plans: Should the new location offer a new mix?
 - Competitive priorities: If the product mix and service mix are different at the new location, the thrust could be on low volumes and high quality.
 - Quality management: Should the goal be reliability or top quality?
 - Process strategy: What processes will be needed to make chicken dinners in the addition or new facility?
 - New technologies: Is it time to automate? Is this why there is a problem in service times?
 - Capacity: How large should the addition or new facility be?
 - Location: Should we locate in Uniontown or expand in Middlesburg?

- b. Attitudes toward nutrition could change the demand for chicken. Competitors such as Boston Market may be planning to move to Uniontown or even Middlesburg. There may be a trend toward demands for ever-faster service, which cannot be supported by the processes specified in the “unique recipe.” The economy of Uniontown might not be supportive of restaurant services. Shoemaker should also consider the availability of key resources, such as servers, whole chickens, spices, and cooking oil. Will Uniontown labor organize?
 - c. The possible distinctive competencies at Grandmother’s Chicken Restaurant include the “unique recipe,” the homey atmosphere, and friendly, prompt service.
10. Wild West, is recognizable as US WEST, which was bought out by Qwest in a hostile takeover in June, 2000. But many other “Baby Bells” are in a similar position.
- a. Strategic plans include reducing overhead, reengineering operations, and investing in new technologies to meet competition. The “do-nothing” option of remaining a local monopoly telephone company is not viable because of competition from cable systems and wireless systems that are capable of business and personal communication. If the mission is too broad, Wild West should sell its financial services and commercial real-estate businesses. Those businesses do not match their distinctive competencies.
 - b. One environmental issue is whether communication, like health care, will be viewed as a “right” and therefore should be free. A significant portion of Wild West’s business is governed by regulatory agencies. Customer service in their core business is essential to maintaining a favorable regulatory environment. Other business opportunities, such as manufacturing and providing information services, are prohibited by the same court order that formed the “Baby Bells” from AT&T.
 - c. Wild West’s distinctive competency is in connecting people (or machines) for the purpose of communication. A weakness is high overhead inherited from the era of telecommunication monopoly.
11. Although the answers may vary depending on the “niche” elements of the business, the competitive priorities would include on-time delivery, low-cost operations, and customization. The latter competitive priority comes from the capability to assemble unique “baskets” of food items for each customer. There may be a need to coordinate a given basket between two different stores. Capabilities to develop would include information systems and Web page design, efficient scheduling of delivery trucks (which must first collect the items in the basket and then deliver them to the customer’s door), and an adequate fleet of trucks with drivers.

PROBLEMS

Addressing the Trends and Challenges in Operations Management

1. Boehring University

a. Value of output:

$$75 \frac{\text{students}}{\text{class}} \times 3 \frac{\text{credit-hours}}{\text{student}} \times \left(\frac{\$200 \text{ tuition} + \$100 \text{ state support}}{\text{credit-hours}} \right) = \$67,500/\text{class}$$

Value of input: labor + material + overhead

$$\frac{\$6500 + \left(\frac{\$25}{\text{student}} \times 75 \text{ students} \right) + \$30,000}{\text{class}} = \$38,375/\text{class}$$

Multifactor Productivity ratio:

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$67,500}{\$38,375} = 1.76$$

Compared to Solved problem 1, multifactor productivity has increased from 1.25 to 1.76.

b. Value of output is the same as in part a: \$67,500/class

Labor-hours of input:

$$20 \frac{\text{hours}}{\text{week}} \times 16 \frac{\text{weeks}}{\text{class}} = 320 \frac{\text{hours}}{\text{class}}$$

Productivity ratio:

$$\text{Labor Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$67,500}{320 \text{ hours}} = \$210.94/\text{hour}$$

The \$192 season ticket price is not used in this calculation. It is a “red herring.”

2. Suds and Duds Laundry

a. Labor productivity

Week	Number of Workers	Input (Labor-hours)	Output (Shirts)	Output/Input Ratio
1	2	24	68	2.83 shirts/hour
2	2	46	130	2.83 shirts/hour
3	3	62	152	2.45 shirts/hour
4	3	51	125	2.45 shirts/hour
5	2	45	131	2.91 shirts/hour

b. Output per person does not vary much whether it is Sud, Dud, or Jud working. Productivity declines when all three are present. Perhaps there isn't enough work to keep three persons occupied, or perhaps there is not enough work space or equipment to accommodate three workers.

3. White Tiger Electronics compact disc players

Value of Output: \$300

Value of Input: Labor + Materials + Overhead

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$300}{\$30 + \$70 + \$50} = 2.000$$

10% productivity improvement $\rightarrow 2.00 \times 1.10 = 2.200$

Given productivity = 2.20, and the value of output = \$300, we solve for the cost of inputs:

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$300}{\text{Input}} = 2.20$$

$$\text{Input} = \frac{\$300}{2.2} = \$136.36 \text{ or } \$136$$

The cost of inputs must decrease by $(\$150 - \$136) = \$14$.

- A \$14 reduction in material costs is $\$14/\$70 = 20.00\%$
- A \$14 reduction in labor costs is $\$14/\$30 = 46.67\%$
- A \$14 reduction in overhead is $\$14/\$50 = 28.00\%$

4. Symtecks

The output of a process is valued at \$100 per unit. The cost of labor is \$50 per hour including benefits. The accounting department provided the following information about the process for the past four weeks:

	Week 1	Week 2	Week 3	Week 4
Units Produced	1124	1310	1092	981
Total Value	112,400	131,000	109,200	98,100
Labor (\$)	12,735	14,842	10,603	9526
Labor (hrs)	254.7	296.8	212.1	190.5
Material (\$)	21,041	24,523	20,442	18,364
Overhead (\$)	8,992	10,480	8,736	7,848
Multifactor Productivity	2.63	2.63	2.75	2.75
Labor Productivity	4.41 units/hr	4.41 units/hr	5.15 units/hr	5.15 units/hr

- Use the multifactor productivity ratio to see whether recent process improvements had any effect and, if so, when the effect was noticeable.

Value of output

$$1124 \text{ units} \times \$100 = \$112,400$$

Value of input: labor + material + overhead

$$\$12,735 + \$21,041 + \$8,992 = \$42,768$$

Productivity ratio:

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

$$\text{Week 1} \quad \text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$112,400}{\$42,768} = 2.628$$

$$\text{Week 2} \quad \text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$131,000}{\$49,845} = 2.628$$

$$\text{Week 3} \quad \text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$109,200}{\$39,781} = 2.745$$

$$\text{Week 4} \quad \text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$98,100}{\$35,738} = 2.745$$

$$\frac{2.745 - 2.628}{2.628} \times 100\% = 4.45\%$$

Improved 4.45% - noticeable in Week 3

- b. Has labor productivity changed? Use the labor productivity ratio to support your answer.

Labor-hours of input: Labor \$50/hour

Labor costs

$$\text{Week 1} = \$12,735/\$50 = 254.7$$

$$\text{Week 2} = \$14,842/\$50 = 296.84$$

$$\text{Week 3} = \$10,603/\$50 = 212.06$$

$$\text{Week 4} = \$9,526/\$50 = 190.52$$

Productivity ratio:

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

$$\text{Week 1} = \text{Labor Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{1124}{254.7 \text{ hours}} = 4.4130/\text{hour}$$

$$\text{Week 2} = \text{Labor Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{1310}{296.84 \text{ hours}} = 4.413/\text{hour}$$

$$\text{Week 3} = \text{Labor Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{1092}{212.06 \text{ hours}} = 5.1495/\text{hour}$$

$$\text{Week 4} = \text{Labor Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{981}{190.52 \text{ hours}} = 5.1491/\text{hour}$$

$$\frac{5.1491 - 4.4130}{4.4130} \times 100\% = 16.68\%$$

Improved 16.68%

5. Alyssa's Custom Cakes

a.

5 Birthday cakes x \$50 per cake = \$250

2 Wedding cakes x \$150 per cake = \$300

3 Specialty cakes x \$100 per cake = \$300

Total monthly revenue = \$850

Multifactor productivity ratio = output/input

$$1.25 = \$850/x$$

Solve for x = $\$850/1.25 = \680

Total costs = \$680

Average cost per cake = $\$680/10 = \$68/\text{cake}$

b. Labor productivity

Birthday cake = $\$50/1.5 \text{ hours} = \$33.30/\text{hour}$ Wedding Cake = $\$150/4 \text{ hours} = \$37.50/\text{hour}$ Specialty Cake = $\$100/1 \text{ hours} = \$100/\text{hour}$

c. Based on labor productivity, Alyssa should try to sell specialty cakes the most.

d. Yes, Alyssa should stop selling birthday cakes. Based on answer a, she loses $\$68 - \$50 = \$18$ every time she sells a birthday cake.

6. Big Black Bird Company

The Big Black Bird Company problem is based on a product made by Raven Industries. None of the numbers are representative of actual costs or volume.

a. Multifactor Productivity

*Original Situation:*Value of output: $(2500 \text{ uniforms} \times \$200) = \$500,000$ Value of input: $(2500 \text{ uniforms} \times \$120) = \$300,000$

Productivity ratio:

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$500,000}{\$300,000} = 1.67$$

*Overtime Situation:*Value of output: $(4000 \text{ uniforms} \times \$200) = \$800,000$ Value of input: $(4000 \text{ uniforms} \times \$144) = \$576,000$

Productivity ratio:

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} = \frac{\$800,000}{\$576,000} = 1.39$$

Productivity decreases by:

$$\frac{1.67 - 1.39}{1.67} \times 100\% = 16.77\%$$

b. Labor Productivity

Original Situation:

Value of output (from part a) is: \$500,000

Labor-hours of input: $(70 \times 40 \text{ hours}) + (30 \times 40 \text{ hours}) = 4000 \text{ hours}$

Labor productivity = $\$500,000/4000$ hours = $\$125/\text{hour}$

Overtime Situation:

Value of output (from part a) is: $\$800,000$

Labor-hours of input: $(70 \times 72 \text{ hours}) + (30 \times 72 \text{ hours}) = 7200$ hours

Labor productivity = $\$800,000 / 7200$ hours = $\$111.11/\text{hours}$

Labor productivity decreases by:

$$(125/111.11) / 125 \times 100\% = 11.1\%$$

c. Gross profits

Original Situation: $\$500,000 - \$300,000 = \$200,000$

Overtime Situation: $\$800,000 - \$576,000 = \$224,000$

Weekly profits increased.

7. Mack's Guitar Company

a. Labor productivity = output/input

Output = 100 guitars x 80% completion rate x price/guitar
= 80 guitars/ month x $\$250/\text{guitar} = \$20,000$

Input

Labor = 10/hours per guitar x 100 guitars = 1000 hours

Labor productivity is $\$20,000/1000 = \$20/\text{hour}$

Multifactor productivity ratio = output/input

Output = 100 guitars x 80% completion rate x price/guitar
= 80 guitars/ month x $\$250/\text{guitar} = \$20,000$

Input

Labor = $\$10/\text{hour} \times 10/\text{hours per guitar} \times 100$ guitars = $\$10,000$

Material = $\$40/\text{guitar} \times 100$ guitars = $\$4,000$

Overhead = $\$4,000$

Multifactor productivity ratio = $\$20,000/\$18,000 = 1.11$

b. Option 1. Increase sales price by 10%

Output = 100 guitars x 80% completion rate x $(\$250 \times 1.1) = \$22,000$

Input

Labor is same as in part (a) = $\$10,000$

Material is same as in part (a) = $\$4,000$

Overhead is same as in part (a) = $\$4,000$

Multifactor productivity ratio = $\$22,000/\$18,000 = 1.22$

Option 2. Improve Quality

Output = 100 guitars x 90% completion rate x $\$250/\text{guitar} = \$22,500$

Input

Labor is same as in part (a) = $\$10,000$

Material is same as in part (a) = $\$4,000$

Overhead is same as in part (a) = $\$4,000$

Multifactor productivity ratio = $\$22,500/\$18,000 = 1.25$

Option 3. Reduce costs by 10%

Output = same as in part (a) = $\$20,000$

Input

Reduce costs by 10% yields 90% of the input costs from part (a).
 = \$18,000 x 0.90 = \$16,200
 Multifactor productivity ratio = \$20,000/\$16,200 = 1.23

Darren should choose Option 2 and improve quality because it yields the greatest improvement in multifactor productivity.

8. Mariah Enterprises Productivity of Process Alpha and Process Beta

Excel used to perform all calculations

	Process		
	Alpha	Beta	
Total Value of Output	\$17,150	\$16,450	
Total Cost of Labor	\$2,600	\$3,000	
Total Cost of Materials	\$5,500	\$4,900	
Total Cost of Overhead	\$6,000	\$5,000	
Labor Productivity	\$6.596	\$5.483	unit \$/ labor \$
Multifactor Productivity	\$1.216	\$1.275	unit \$/ total \$

Process alpha has 20% [(6.596-5.483)/5.483] higher labor productivity.

Process beta has 5% [(1.275-1.216)/1.216] higher multifactor productivity.

While process beta generates more dollars of output per dollar invested in input, it doesn't use labor as efficiently as process alpha.

9. Morning Brew Coffee Shop

Excel used to perform all calculations

a. Current labor and multifactor productivity

Currently	Regular Coffee	Cappuccino	Vienna coffee	total
Output in dollars	\$700.00	\$300.00	\$600.00	\$1,600.00
Labor cost				\$320.00
Material cost	\$175.00	\$75.00	\$187.50	\$437.50
Equipment cost				\$125.00
Overhead cost				\$225.00
			Profit	\$492.50

Labor Productivity 5.0000
 Multifactor Productivity 1.4447

After adding new product

After Adding New Product	Regular Coffee	Cappuccino	Vienna coffee	Eiskaffee	total
Output in dollars	\$700.00	\$300.00	\$600.00	\$375.00	\$1,975.00
Labor cost					\$320.00
Material cost	\$175.00	\$75.00	\$187.50	\$112.50	\$550.00
Equipment cost					\$200.00
Overhead cost					\$350.00
	Profit				\$555.00

Labor Productivity 6.1719
 Multifactor Productivity 1.3908

Change in Labor Productivity 23.438%
 Change in Multifactor Productivity -3.727%

- b. The units of Eiskaffee that would have to be sold to ensure that the multifactor productivity increases from its current level may be calculated as follows:

$$\frac{\text{output}}{\text{input}} = \frac{\text{Coffee sold in \$}}{\text{Labor cost} + \text{Material cost} + \text{Equipment cost} + \text{Overhead cost}} = 1.4447$$

$$\frac{350(\$2) + 100(\$3) + 150(\$4) + x(\$5)}{320 + (350(\$0.5) + 100(\$0.75) + 150(\$1.25) + x(\$1.5)) + 200 + 350} = 1.4447$$

$$\frac{\$1600 + \$5.0x}{\$1307.5 + \$1.5x} = 1.4447$$

$$\$1600 + \$5x = 1.4447(\$1307.5 + \$1.5x)$$

$$\$1600 + 5x = 1888.945 + 2.1670x$$

$$2.833X = 288.945$$

$$x \cong 102$$

Calculation confirmed in Excel:

After Adding New Product	Regular Coffee	Cappuccino	Vienna coffee	Eiskaffee	total
Output in dollars	\$700.00	\$300.00	\$600.00	\$510.00	\$2,110.00
Labor cost					\$320.00
Material cost	\$175.00	\$75.00	\$187.50	\$153.00	\$590.50
Equipment cost					\$200.00
Overhead cost					\$350.00
	Profit				\$649.50

Labor Productivity	6.5938
Multifactor Productivity	1.4447

Change in Labor Productivity	31.875%
Change in Multifactor Productivity	0.001%

CASE: CHAD'S CREATIVE CONCEPTS*

A. Synopsis

This case describes a small furniture manufacturing company that has gained a reputation for creative designs and quality by focusing on producing custom-designed furniture. As its reputation grew it began to sell some standard furniture pieces to retail outlets. The overall growth in sales volume and the diversification into the production of standard furniture pieces have caused a number of issues to arise concerning both the internal manufacturing operations and its relationship to the other functional areas of the company.

B. Purpose

This case is designed to be used as either a “cold-call” case for class discussion or an assigned homework reading. Major points to be brought out in the discussion include:

1. The range of decisions that are made in designing and operating processes
2. The impact that these operating decisions have on the organization as a whole, such as on marketing and finance
3. The impact that decisions made in other functional areas of the organization have on the operating function
4. The need to go beyond the “functional silo” mentality and manage in an integrative manner

* This case was prepared by Dr. Brooke Saladin, Wake Forest University, as a basis for classroom discussion.

C. Analysis

Question 1: *What types of decisions must Chad Thomas make daily for his company's operations to run effectively? Over the long run?*

The students should be able to discuss a number of short-term-oriented decisions that are facing Chad Thomas. These should include:

- a. How to set priorities and schedule different orders. Chad is receiving orders for both custom-made, low-volume furniture pieces and higher-volume, standard pieces. Sales have increased, but the amount of equipment and the production capacity of the company have not. Different orders with different manufacturing requirements are now competing for the same productive capacity.
- b. What orders to accept and how long of a lead time to plan for in promising a delivery date.
- c. What type of work policies should be maintained for his employees? Decisions such as the number and type of employees to employ, the number of hours to work per day, and the amount of overtime to allow are all work policy decisions that impact the available capacity level.
- d. The allocation of resources, equipment, labor, and money to each product line.
- e. The level of inventory to maintain at various stages of the production process for both the custom and standard furniture lines (i.e., raw material, WIP, finished goods). These decisions are linked to the longer-term, total inventory-investment decision.

Examples of longer-term decisions that face Chad Thomas include:

- a. Amount of money to tie up in the total inventory investment.
- b. The type of equipment to invest in to support efficient production. At what point should more specialized equipment be purchased to manufacture high-volume, standard furniture pieces more efficiently?
- c. What should be the overall workforce level to maintain, and what should be the proper mix of skills and capabilities?
- d. How should the facilities be laid out to accommodate the two different product lines? This gets the students into a whole range of capacity and equipment allocation decisions including size, type, and configuration.

In these decisions it is important that the students see the significance of consistency of both strategic and operating decisions across functional areas.

Question 2: *How did sales and marketing affect operations when they began to sell standard pieces to retail outlets?*

Standard furniture pieces compete on a different set of competitive priorities than custom-designed pieces. Timely delivery and low costs are much more important than product flexibility. Quality may also be defined differently. The existing facilities are set up to provide flexibility with its job-shop orientation and general-purpose equipment. By introducing a standard line that should be manufactured on a flow line with some dedicated, more specialized equipment, a conflict has developed, and scheduling problems have resulted.

Question 3: *How has the move to producing standard furniture pieces affected the company's financial structure?*

Inventory investment and operating costs are rising because of the frequent changeovers to accommodate the two different product lines and their scheduling conflicts.

Profit margins for the standard line are smaller, which puts pressure on manufacturing to increase productivity and reduce costs. There may also be an issue concerning the assignment of overhead costs to each product line.

Finally, the potential need to rent warehouse space to store either WIP or finished-goods inventory cuts into the profit margin for the standard furniture line.

Question 4: *What might Chad Thomas have done differently to help avoid some of these problems he now faces?*

Chad needs to address issues relating to functional areas. Make sure the student is able to identify decisions that relate to more than one functional area. Examples include the following:

Operations Function

1. Monitoring capacity and utilization of facilities
2. Formulating inventory policies—dollars, items, and unit levels
3. Setting scheduling policies and priorities
4. Maintaining product line quality

Marketing and Sales

1. Accurately forecasting orders for standard pieces
2. Defining market segments and customer needs
3. Determining what delivery schedules can be promised to customers

Finance

1. Deciding level and type of investment
2. Investigating the effect of capacity investment decisions on ROI

Distribution/Logistics

1. Managing distribution and pipeline inventory
2. Comparing cost and advantages of various transportation modes
3. Meeting delivery lead times

Three possible avenues that students may focus on are: Thomas might have

- a. Established a plan for a more controlled growth. Part of this plan would be the development of the appropriate infrastructure to manage a controlled growth as to what markets to enter, what product lines to develop, and how to develop the proper manufacturing capabilities.
- b. Maintained the company focus on custom-designed furniture only. This alternative presents a whole different set of issues and decisions pertaining to future growth, but it would have avoided the issues of mixed competitive priorities and scheduling conflicts.
- c. Realized the different requirements for each product line and focused the manufacturing facilities into two separate sets of production facilities designed to cater to each product line's specific needs.

D. Recommendations

This case is not designed to be a decision-making case per se but rather a vehicle to get students thinking about the types and the integrated nature of decisions that operations managers face. The students may, indeed, have suggestions as to what should be done to help out Chad Thomas. These recommendations will more than likely follow the alternatives already discussed. As recommendations are provided by students, make sure you push them to understand the implications of their recommendations with respect to the company as a whole and the other functional areas.

E. Teaching Strategy

This case can be effectively discussed in 20 to 30 minutes by following the discussion questions provided at the end. The questions are interconnected and somewhat redundant on purpose to reinforce the interrelatedness of decisions made in various functional areas of the company. The intent is to have the students understand the range of decisions that face managers in the operating function and to realize that different types of products competing in different markets place different demands on the operating function. Therefore, productive systems will take on a variety of configurations.

Exhibit TN.1 lays out a sample table to be written on the board displaying important issues in the class discussion. Each column can be used to compare and contrast the differences in the requirements imposed by custom versus standard furniture for each area.

EXHIBIT TN.1	Board Plan
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Important Issues	Custom Furniture	Standard Furniture
Marketing		
Quality level and quality control		
Process equipment		
Process flow		
Production scheduling system		
Purchasing		
Type of inventory and inventory control system		
Type of engineering		
Type of labor and supervision needed		
Wage/reward system		
Layout		

CASE: BSB, INC.: Pizza Wars Come to Campus

A. Synopsis

BSB, Inc. presents the situation where launching a pizza service at a food service operation on a college campus turns out to be very successful. As the manager of the food service operation is contemplating an expansion of the service, an announcement by the university that a new food court will soon be opening in the new student union causes some concern. The new food court will contain, for the first time on campus, other food service companies, including a new Pizza Hut kiosk. This causes the manager of BSB, Inc. to reevaluate the competitive environment and her own competitive priorities.

B. Purpose

BSB, Inc. provides the students an opportunity to discuss a number of strategically focused issues to include the following:

1. *Mission statements:* Mission statements describe the fundamental purpose for which the organization exists. The university decided that a focus on food service operations was not part of its primary mission, so it contracted the service out to BSB, Inc. Students should be able to describe a mission statement for BSB, Inc. This statement will help in discussing the second major focus of this case.
2. *Comparison of competitive priorities:* When the pizza service was launched a year ago, the competitive priorities were to expand the product line to offer pizza that could be delivered quickly at a reasonable price. Costs were kept low, and turnaround time was short due to the limited combination of toppings available.
 With the addition of the food court and Pizza Hut on campus, competitive priorities may change. Delivery may still be a differentiating competitive priority, but product flexibility (variety) and volume flexibility (large order sizes) may become more important. BSB, Inc. may not be able to compete on low cost when compared to Pizza Hut's operations.
3. *The impact changing competitive priorities has on operating decisions:* Students need to discuss the potential impact that different competitive priorities have on process design and operating systems. If product flexibility and volume flexibility become more important, then there are implications for:
 - a. Equipment needs—conventional oven versus continuous chain drive
 - b. Capacity requirements—order size and delivery cycle
 - c. Inventory issues—inventory needed to support product flexibility
4. *Product life cycles:* Demand for pizza on campus has leveled off. Why? Has it reached its mature, steady state? What will be the impact of new competition? What can be done to reposition pizza into a growth stage? These are questions that should be asked of students to get them to think about pizza's product life cycle.

C. Analysis

A good analysis of the situation can be performed by going through the five questions at the end of the case. The following is what you can expect from a first-year MBA student given the case as a take-home assignment to read and to respond to the questions at the end.

Question 1: *Does BSB, Inc. enjoy any competitive advantages or distinctive competencies?*

BSB's competitive advantage is close proximity to the customers. Though 43 percent of meals are eaten off campus, 57 percent of meals are still eaten at BSB's facilities. For pizza delivery the close proximity is critical, as it allows for quicker delivery. In addition, delivery can be done at a lower cost because bikes can be used.

BSB's distinctive competencies are the location of facilities and market know-how. Being on campus, BSB can provide delivery service quicker and at a lower cost. In addition, by being on campus, BSB is closer to the customer base, which allows Kershaw, the manager, to be more knowledgeable of her customer's needs. She employs environmental scanning, such as the customer surveys, to keep abreast of her market.

Question 2: *Initially, how did Renee Kershaw choose to compete with her pizza operations? What were her competitive priorities?*

Initially, Kershaw chose to compete on delivery service and price. She used quick delivery as a key selling point. In addition, without a reasonable price, she could not compete with the off-campus pizza companies. In effect, her order qualifier was price, and her order winner was service.

Her initial competitive priorities for pizza were delivery speed and price. Her on-campus location and limited standard toppings make these priorities possible. Unfortunately, this policy limits the variety of pizzas available. The increased requests for additional topping combinations and the leveling of sales suggest this policy may be hurting BSB.

Question 3: *What impact will the new food court have on Kershaw's pizza operations? What competitive priorities might she choose to focus on now?*

The new food court introduces new competition that has the same on-campus advantage as BSB. In addition, these companies can also provide products at reasonable prices, but unlike BSB, they have brand names. Her direct competitor, Pizza Hut, can probably provide a similar price. Most likely Pizza Hut will also have limited varieties; however, BSB still maintains its delivery advantage.

The most likely new competitive priorities for BSB will be expanded product variety and longer service hours. The increased requests for alternate toppings show a customer interest in variety, and the expanded hours will enable BSB to offer service when the Pizza Hut is closed or when students are in their dorm rooms.

Question 4: *If Kershaw were to change the competitive priorities for the pizza operation, what are the gaps between the priorities and capabilities of her process? How might this impact her operating processes and capacity decisions?*

An increase in product variety will affect both service and cost. Kershaw probably cannot have as many premade pizzas ready to throw into the oven. She will also need to stock additional toppings. If she wants to maintain service, she will need to hire additional workers. She will inevitably have some trade-off between service and price if she adds product variety.

Kershaw will also need to add capacity. At present, she is near capacity with her pizza ovens. She may even have to consider a new location, as there seems to be limited space at the grill location. Clearly she will need to determine the viability of pizza service before she takes this step.

Question 5: *Can you outline a service strategy for Kershaw's operation on campus?*

If she chooses to stay in the pizza business, delivery will remain important. Food, most likely pizza, delivered from off campus, is a significant competitor. These competitive companies likely offer many pizza combinations. Therefore, BSB will need to increase variety to remain competitive. The key to this strategy is to maintain quality and to innovate on product offerings. Kershaw must use her proximity to the customer to maintain her competitive advantage in determining their pizza delivery needs.

The other strategy would be total price competition. This would require her to keep the limited menu and to push to keep costs at a bare minimum. Unfortunately this means maintaining the same basic strategy she has now. However, this strategy will most likely lead to an inevitable decline in market share. This strategy seems best if she decides to exit the market, but it gives her the opportunity to milk the market before exiting.

In reviewing the student responses the instructor should note the following:

1. On question three, the student overlooks the continued importance of convenient, quick delivery. The other food services do not provide this service.
2. Students tend to hedge on question five. They should be pressured into putting together a service strategy as opposed to describing alternative choices only.

There are a number of positions Kershaw may take. What is important, however, is to look for consistency in the strategies that students provide.

D. Teaching Strategy

This case is best assigned as a take-home assignment. Have the students focus on responding to the questions at the end of the case. Tell them to pay particular attention to the last question. The first four questions all lead up to the last one where students should describe a service strategy for pizza operations of BSB, Inc. Tell students you want them to settle on a specific strategy they can support.

In class, start with the first question and cycle through to the final question, which describes their service strategies. It is helpful to try to get two or three different strategies on the board to compare and contrast approaches. It is important that students see that there are a number of good alternative strategies and not just one best one.

A thorough discussion of this case will take 45 minutes to an hour, especially if alternative strategies are discussed.