# Chapter 1: Introduction to Operations Management

## Overview

This chapter provides the definition of operations management. The role and importance of operations management in an organization are described, along with operations decisions that are made by managers. The transformation process from inputs to outputs is introduced. The differences between manufacturing and services are described. The historical developments and current trends in operations management are discussed, including the impact of information systems. Finally, the interaction between operations management and other business functions are described.

## Teaching Tips and Strategies

I begin by giving examples of situations where the students have been affected by operations decisions. Then I define operations management. I explain how operations management is the foundation of the firm, which is supported by the business functions. I point out that this does not make the other functions any less important. However, businesses provide a product or service to customers. Many of the key decisions related to that product or service fall within the operations function. Students really enjoy the 7-minute clip I show from the movie “The Hudsucker Proxy” that demonstrates the different business functions in an organization (The idea for using this video clip came from Brown et al. 1996). This 1994 Warner movie includes the cast of Tim Robbins, Jennifer Jason Leigh, and Paul Newman. The scene I show, which is 63 minutes after the start of the movie, begins with the main character presenting the hula hoop to the board of directors in an effort to convince them to agree to make and sell it. Then the scene moves quickly back and forth between production, marketing, and accounting. The scene ends with a dramatic sales increase where kids literally run to a retailer to buy hula hoops. This can lead into a discussion about the different business functions. Next, I describe the differences and similarities between manufacturing and services and the transformation process. I briefly discuss all the types of operations decisions. Finally, I discuss the current trends in operations management.

In class, I often ask students to name companies that dominate their sector through excellence in operations management. Students have little difficulty identifying companies that dominate their sectors. Often, Wal-Mart, McDonalds, and Dell are mentioned. I then ask them to tell me on what basis are these companies effective in terms of operations. Here students often have more difficulty. Separating operational excellence from other aspects of a well-run company is more difficult. Often, they mention marketing, pricing, or image. To get them back on track, I ask them to tell me what inputs are being transformed into what outputs and how their example excels in this. The examples of Dell transforming components to completed computers, and Wal-Mart’s close relationship with Proctor & Gamble help them understand what a transformation process is.

***Linking operations management with other business functions***

None of my students major in operations management, so it is useful to put it in perspective and link it to other business functions. Several of the topics toward the end of the chapter can help. Using Figure, 1-11, I introduce the concept of the flow of information between operations and other business functions. I ask the class to come up with examples. I try to involve areas where students believe there is little link, such as marketing. I ask the students to come up with four items for a piece of information:

1. What function would have primary responsibility?
2. Why would this function need it?
3. What other function may need this information?
4. Why would they need it?

For example, the amount of time it would take to complete accepted orders would be the responsibility of manufacturing. They would need it to schedule work. However, sales would also use this information to have an idea of how quickly a newly accepted order could be completed.

***Plan for the rest of the book and for the course***

The less than completely engaged student may find the semester to be just a sequence of unrelated topics. Figure 1-6 can give them some perspective. We start with strategic topics that have a long horizon and set the environment for later topics. We end with day-to-day and hour-to-hour topics, such as sequencing and scheduling. I also point out that we cover forecasting before inventory because uncertainty of demand is what makes inventory control difficult.

***Introducing ERP***

The text introduces ERP in the section, Today’s OM Environment. The main discussion of ERP is in the Resource Planning chapter. Many students find it difficult to understand. I try to introduce some of the concepts here. For example, Figure 1-11 helps when talking about the need to share information across functions, and the supply chain material along with the John Wood links to the Practice section, help to introduce the topic of sharing among firms. I close out the discussion on ERP by pointing out that it is incredibly expensive to buy and install, but companies do. There must be significant value in doing so.

***Ethics***

One of the big issues in AACSB accreditation is ethics. The section on outsourcing will often lead to a spirited discussion. I ask the students to think in terms of who benefits and who does not. I ask them to consider the net benefit to the countries outsourcing and performing the work.

**War Stories**

##### ***The Relationship between Business Functions***

An executive at a gun manufacturer told me this story a number of years ago. He knew a Vice-President (VP) working for another gun manufacturer. The VP decided to sell bullets in boxes of 24 each. Before making this decision, the bullets were being sold in boxes of 20 each. He made this decision without consulting the operations manager and sold orders. When the operations managers were asked to process the orders, he was told that it would cost approximately $200,000 to change the setup of the machine that automatically filled the boxes with bullets. So, they ended up filling the orders by hand. Needless to say, the VP had to explain why the company had sold the most bullets ever, yet was losing money. He also did not take into account that one of their competitors consistently reacted to any changes made by gun manufacturers by cutting its prices in half and offering rebates (5% of total sales per year). The VP reacted by offering rebates as well. At the end of the year, he tried to unsuccessfully back out of the rebates. First, he decided not to offer the rebates at all. After being confronted by many lawyers representing customers, he decided to offer rebates on the difference between the sales of the last two years. After another confrontation with the lawyers, he reluctantly decided to stick to the deal, which further decreased the performance levels of the company.

**Answers to Discussion Questions**

1. *Define the term operations management.*

Operations management manages the resources and the transformation processes needed to produce the company’s products and services. It involves managing people, machines, and information.

1. *Explain the decisions operations managers make and give three examples.*

Operations managers must plan the production schedule. This entails deciding how much to produce and in what order. This information would be used to make purchasing and staffing decisions. Operations managers must manage inventory. They must arrange the inventory in the warehouse. They also facilitate the movement of inventory from the warehouse to the retail facilities or customers. Operations managers must also manage quality levels. This may include inspection of materials and the use of quality tools, such as control charts.

*3. Describe the transformation process of a business. Give three examples. What constitutes the transformation process at an advertising agency, a bank, and a TV station?*

The transformation process involves taking the various inputs and transforming them into outputs. An advertising agency would transform the time of its staff into an advertising campaign. A bank may use the time of a teller, an input computer, and a bank branch to accept a deposit. A TV station could use the time of its production crew, the video equipment, and the studio to produce a news story.

*4. What are the three major business functions, and how are they related to one another? Give specific examples.*

The three major business functions are finance, marketing, and operations. Operations entail the production of a product or service and must manage the inputs to production such as workers' time, materials, and machine time to create airplane parts. Finance manages the assets—the building used for production, investments, and cash flows related to production, such as providing the required machines. Marketing generates sales of the product or service, such as finding customers for the proposed airplanes.

*5. What are the differences between strategic and tactical decisions, and how are they related to each other?*

Strategic decisions are Decisions that set the direction for the entire company; they are broad in scope and long-term in nature. While tactical decisions are decisions that are specific and short-term in nature and are bound by strategic decisions.

*6. Find an article that relates to operations management in either the* *Wall Street Journal*, *Fortune*, *or* *Business Week. Come to class prepared to share with others what you learned in the article.*

Students' answers will depend upon the article found. An example would be the recent articles discussing the problems the US automobile firms are facing, and are ultimately reducing the costs in producing their main outputs: automobiles and trucks.

*7. Examine the list of Fortune* *magazine’s top 100 companies. Do most of these companies have anything in common? Are there industries that are most represented?*

Students should be able to find the list through their university library. While the top 100 contain firms in many different industries, students will probably notice that Oil, Finance, Retail, and Automobiles are heavily represented.

*8. Identify the two major differences between service and manufacturing organizations. Find an example of a service and manufacturing company and compare them.*

Service organizations involve the customers in their operations to some degree, while manufacturing organizations do not. Manufacturing organizations produce a physical product that can be stored in inventory. Service organizations cannot create an inventory of the service since it is intangible. For example, *Ford Motors* is a manufacturer. It makes automobiles, customers have minimal contact with the operation, and they can create an inventory of vehicles. *McDonalds* is an example of a service organization. Customers go directly to the restaurant where they are served readily by the staff.

1. *What are the three historical milestones in operations management? How have they influenced management?*

Three historical milestones that have influenced management are the Industrial Revolution, total quality management (TQM), and global competition. The Industrial Revolution changed production processes from a labor process to a machine process. TQM caused managers to be more focused on quality and preventing defects. Finally, global competition caused managers to further increase their focus on quality in order to compete in the global market.

1. *Identify three current trends in operations management and describe them. How do you think they will change the future of OM?*

The lean systems concept is a current trend in operations management. This involves taking a total system approach to creating an efficient operation. This includes concepts such as just-in-time (JIT), total quality management (TQM), continuous improvement, resource planning, and supply chain management (SCM).

Companies are using the Internet to reach out to customers and suppliers directly. Amazon.com has been able to sell books and many other items directly from its warehouse. The Internet is changing how the supply chains work since we can now eliminate the “middle man” or distributor by selling directly from the factory to the end customer. Companies can also ease transactions between businesses, known as B2B commerce, by using electronic trading networks.

Large information systems, called enterprise resource planning (ERP) systems, are allowing companies to increase efficiency. These large, sophisticated software programs coordinate, across the entire enterprise, the activities involved in producing and delivering products to customers.

Each of these concepts makes intensive use of information and cooperation between partners. OM will most likely continue to be more information intensive and require greater cooperation among all the players in the value chain.

1. *Define the terms total quality management, just-in-time, and reengineering. What do these terms have in common?*

Total quality management (TQM) is a philosophy that focuses on meeting the needs of the customer. TQM is not the inspection, but the prevention of defects. It involves everyone in the organization. Just-in-time is a philosophy that focuses on reducing inventory and other wastes, and is focused on producing the right number of items at the right time. Reengineering focuses on improving business processes in order to improve efficiency. Each of these techniques strives to allow more responsive and efficient production leading to higher quality and higher customer satisfaction.

*12. Describe today’s OM environment. How different is it from that of a few years ago? Identify specific features you think characterize today’s OM environment.*

Today’s OM environment is more global, more service oriented, and uses more information technology than that of a few years ago. Companies can outsource steps of their operation easily. Now even service operations are outsourced offshore. Information technology allows companies to cooperate more closely, create tighter supply chains, generate quicker response, and reduce wastage of resources. Also, lean systems: ERP, CRM, and cross-functional decision making. Specific features include greater outsourcing, greater use of information technology, and greater cooperation in the supply chain.

*13. Describe the impact of e-commerce on operations management. Identify the challenges posed by e-commerce on operations management.*

E-commerce has greatly impacted the relations companies have with their suppliers and customers. This allows tighter co-operation with suppliers, which can lead to quicker and more accurate deliveries, and lower inventory. Suppliers can become involved with producers early in the product design. This can lead to better quality and lower production costs. E-commerce also creates better links between companies and their customers. This improves their ability to predict and provide what the customers want. Further, e-commerce shifts the balance between performing a task in-house and outsourcing. This has lead to greater outsourcing as companies focus more intensely on their core competencies.

As communication and offshoring become easier, not only can a company reach wider markets, but they are also exposed to competition from wider markets and from firms in their markets that have improved their competitive position by effective use of the opportunities available through e-commerce.

*14. Find a company you are familiar with and explain how it uses its operations management function. Identify what the company is doing correctly. Do you have any suggestions for improvement?*

Students’ responses will depend on the company chosen. Many undergraduate students have worked in food services, such as fast food restaurants and supermarkets. They should be able to identify how the materials are ordered and handled, how the operations are staffed, and how the customers are served.

**Answers to Case – Hightone Electronics, Inc.**

1. Explain why operations management is critical to the success of a business. Why would developing an Internet-based business require different operations considerations for HEI? Is George Gonzales correct in his assessment that this would not be “business as usual”?

Operations management is critical because it determines the quality of the product and the delivery performance of the product. Different operations management considerations would occur for HEI with Internet-based division for several reasons. First, they would need some procedure for processing the orders from the Internet. Products were offered for sale through a catalog that was mailed to prospective customers every four months. The addition of the Internet-based division increases the customer base. This would change their demand. So now they have to adjust forecasts and production plans accordingly. In addition, they may receive orders from abroad, and they would then have to deal with tariffs, duties, and customs. Yes, George Gonzales is correct in his assessment that this would not be “business as usual.”

1. Recall that HEI wishes to continue its reputation of high quality and service. Identify key operations management decisions that need to be considered. How different will these decisions be for the Internet-based business?

The high level of service will be more difficult to deal with. They have built a reputation on delivering most items within 48 hours of the order. This will be more difficult since demand will increase once the Internet-based division is launched. Forecasting can no longer rely on past demand since it is not known for this division. They will have to rely on qualitative forecasting techniques for this division’s demand. They need to be prepared by having excess capacity. They should also increase their inventory levels before the new division is brought on line.

**Answers to Case – Creature Care Animal Clinic (A)**

1. *Identify the operations management problems that Dr. Barr is having at the clinic.*

The two operations management problems described in the case are scheduling and inventory control. Scheduling problems include having both excess and inadequate staff. Inventory problems include stock-outs and obsolescence.

1. *The schedule Dr. Barr set up worked well at the clinic where she was a resident. What are some of the reasons why it might not be working here?*

There are several factors that could make a schedule that worked at another clinic not work for Dr. Barr. The community may be different, with different working patterns and different pets.

*3. Identify some of the reasons why the clinic is having inventory problems.*

There is no formal system to control inventory. The process of placing purchase orders is not centralized. The staff is ordering for their needs without coordination, policies, or knowledge of demand.

*4. What should Dr. Barr have done differently to avoid some of the problems she is currently experiencing?*

Dr. Barr should have planned her operations better. She should have studied her market in order to get a better idea of weekly and daily demand. She should have set processes in place to control inventory and to schedule staff.

*5. What suggestions would you make to Dr. Barr now?*

Dr. Barr should now put in place procedures that allow the clinic to have better control over staff scheduling and inventory. The clinic should collect data so that they understand demand patterns, both demand for staff and demand for supplies. Once demands are known, the clinic should develop a scheduling system and inventory control that meets demands without excess expense.

**Complete Manuals for the Interactive Cases also are available on the companion site:** [**www.wiley.com/college/reid**](http://www.wiley.com/college/reid)**.**

**Interactive Learning**

The student version of the web site for this textbook includes PowerPoint chapter review, selected solutions, several interesting company tours, web links, and business simulations. These include several demonstration simulations that can be used to introduce topics in operations management. For example, the packaging line and tire manufacture simulations demonstrate the concept of transformation, and the bank and supermarket simulations demonstrate competition for scarce resources.

###### In Class Exercises

I would like to thank Professor William A. Ruch for the use of this interesting exercise on the transformation process. The following exercise helps the students think about operations management issues for an item they are all familiar with – the backpack. The following exercise takes approximately 40 minutes for the students to answer in class by forming teams. I give it out at the end of class, while allowing enough time, so that students can leave as soon as they have completed the exercise. I give the students the option of working individually or in teams of up to five students. When I hand out copies of the exercise, I ask the students to take one copy per person and one copy per team. This way each student will have a copy of the assignment. I only require one copy per team to be submitted for grading.

**TRANSFORMATION EXERCISE HAND IN ONE CLEAN COPY**

Please provide names and signatures (only for team members who are present today):

|  |  |
| --- | --- |
| NAME (Print) | SIGNATURE |
| 1. |  |
| 2. |  |
| 3. |  |
| 4. |  |
| 5. |  |

One of the members of your team must have a backpack to carry books (if not, borrow one from another team). The purpose of this exercise is to get more specific about the inputs, transformation, and outputs that we read about in Chapter 1. Examine that backpack and then answer the following questions on the front and the back of this sheet.

* + - 1. What are the material inputs needed to make a backpack? Be specific. You should list at least six, maybe twelve or more depending on the design of your backpack.
1. What other MATERIAL (not equipment) inputs are needed that are necessary to produce and deliver the backpack to the customer, but are not part of the backpack itself?
2. What types of production workers (skills) are needed to manufacture the backpack? Name four or more like "material cutters."
3. What types of equipment, tools, furnishings, etc. are needed?
4. Describe the PROCESS. In other words, what are the major steps necessary to produce the backpack? Begin with "ordering of raw material" and end with "deliver to the retailer."
5. Your primary output is the backpack. But what services do you provide to your customer along with the backpack? Name three or more.

**TRANSFORMATION EXERCISE ANSWER KEY**

One of the members of your team must have a backpack to carry books (if not, borrow one from another team). The purpose of this exercise is to get more specific about the inputs, transformation, and outputs that we read about in Chapter 1. Examine that backpack and then answer the following questions on the front and the back of this sheet.

What are the material inputs needed to make a backpack? Be specific. You should list at least six, maybe twelve or more depending on the design of your backpack.

**Zippers Thread**

**Glue Logo**

**Buckles (for adjusting straps)**

**Padding for straps Fabric for straps**

**Fabric for main parts of backpack**

* + - 1. What other MATERIAL (not equipment) inputs are needed that are necessary to produce and deliver the backpack to the customer, but are not part of the backpack itself?

**Production inputs: Needle, Spools (that hold thread)**

**Delivery inputs: Boxes, Mailing labels for boxes, tape to seal boxes, and covering to protect backpack during shipment**

* + - 1. What types of production workers (skills) are needed to manufacture the backpack? Name four or more like "material cutters."

**Sewing workers**

**Gluing staff**

**Material handlers**

**Assemblers**

**Quality control staff**

* + - 1. What types of equipment, tools, furnishings, etc. are needed?

**Sewing machine**

**Cutting machine and/or scissors**

**Plastic molding machine to make buckles**

**Tables for workstations**

**Chairs for workers**

* + - 1. Describe the PROCESS. In other words, what are the major steps necessary to produce the backpack? Begin with "ordering of raw material" and end with "deliver to the retailer."

**Ordering of raw material**

**Make buckles**

**Cut fabric**

**Make straps**

**Sew zippers to fabric**

**Attach straps and buckles**

**Glue logo on**

**Inspection**

**Pack in boxes**

**Deliver to retailer**

* + - 1. Your primary output is the backpack. But what services do you provide to your customer along with the backpack? Name three or more.

**(Customers are both retailers and students)**

* **Customized backpacks (color, size, features, such as padded back, university logo)**
* **Vendor managed inventory (VMI) – we manage the retailer’s inventory of our backpacks**
* **Lifetime warranty on the backpack (repair, replacement)**
* **Repair service**
* **Web site that provides information on the variety of backpacks available, along with other information such as a retailer directory**

**References**

Brown, K. A., Hyer, N. L., Smith-Daniels, D. and Sprague, L., “Cinematic Ticklers: Using Movie Clips to Stimulate Classroom Discussion About Operations Management Issues,” Proceedings of the 1996 Annual Meeting of the Decision Sciences Institute, 1189.