10.1: Course Introduction

Unit 1: Operations Management Overview

BUS300: Operations Management

Course Introduction

Operations management is a science with which we are all, in some capacity, familiar. We all have scarce resources and have to allocate those resources properly. Think about the process of preparing a meal: you have to gather all the proper ingredients and prepare them for cooking. Certain ingredients go in at certain times. Occasionally, you fall behind or get too far ahead, jeopardizing the entire meal. And, of course, if you find that you do not have enough ingredients, even more problems arise. All of these elements of meal preparation – purchasing ingredients, prepping the ingredients by dicing them up, mixing ingredients together, boiling or baking the dish, serving, and cleaning – can be seen as parts of operations management. In the realm of business, operations management is more complicated than preparing a family meal. There may be hundreds or thousands of participants rather than just you and your brother or wife or grandfather cooking in the kitchen. Each participant has a specific role in the operations process; if any step of the process is disrupted, the whole process can stall or fall apart. Smart operations managers will have contingency plans in the event that stoppages occur. In this course, you will learn the fundamentals of operations management as they apply to both production and service-based operations. Successful completion of this course will empower you to implement the concepts you have learned in your place of business. Even if you do not plan to work in operations, every department of every company has processes that must be completed; someone savvy with operations management will be able to improve just about any process.

Course Syllabus Page

Course Terms of Use Page

Operations management is a vast topic but can be bundled into a few distinct categories, each of which will be covered in later units. (It should be noted, however, that entire courses could be devoted to each of these topics individually.) Because most people do not work in a formal operations department, we will begin with an overview of operations management itself. The top manager of an operations department is usually called the Director of Operations. Most operations departments will report to a Chief Operating Officer (COO), who reports to the Chief Executive Officer (CEO). The COO is often considered the most important figure in a firm, next to the CEO.

The history of operations management can be traced back to the industrial revolution, when production began to shift from small, local companies to large-scale production firms. One of the most significant contributions to operations management came in the early 20th century, when Henry Ford pioneered the assembly line manufacturing process. This process drastically improved productivity and made automobiles affordable to the masses. Understanding the motivations behind innovations of the past can help us identify factors that may motivate individuals in the future of operations management.

Completing this unit should take you approximately 7 hours.

Unit 2: Operations Strategy

The most significant aspect of operations management is the process itself. How does Apple take a pile of chips, glass, and plastic, and turn it into an iPhone? Their manufacturer in China is responsible for this process, but Apple is involved every step of the way in order to ensure quality, reliability, and consistency. Process flow structures are the different methods of production deemed appropriate for various manufacturing contexts. Does it make sense for Apple to wait for 1 million orders, then make and ship them? Or should they instead produce iPhones based on current demand and try to balance inventory? These are decisions that the COO must make as each process flow has various costs associated with it.

Additionally, not every operations department is producing a good we can consume. Wall Street traders receive orders from clients and must execute trades on open markets. The order itself may pass through dozens of people before confirmation of the trade is sent back to the client. If you consider that “actual trade” to be the product, you can design an operations process around the goal of executing the trade. The result is a process remarkably similar to production. In this unit, you will learn how operations managers use long-term, strategic planning to manage internal and external influences on the organization’s resource base.

Completing this unit should take you approximately 5 hours.

Unit 3: Product Design and Process Selection

If you have purchased a mobile phone recently, you have witnessed a product category with perhaps the most diverse range of product designs in the marketplace. The variety can be mind-boggling. Looking back a year or two, you can probably recall a

design that looked very promising, but simply faded away from the shelves after a few months. Have you ever wondered what happened to those short-lived products?

Businesses want to design the products that consumers demand. A good marketing department can tell the organization what consumers want, and even convince consumers that they want it. A company with the most wonderful product concept cannot be successful unless it also can devise a process to profitably manufacturer the product. In this unit, we will consider the steps involved in designing a product with the manufacturing process in mind. We will look at several models that businesses can use to select the best design process or analyze an existing process.

Completing this unit should take you approximately 8 hours.

Unit 4: Quality Management

Quality management is a primary concern in operations departments. Though all employees and managers should be concerned with maintaining quality, most firms host a team dedicated to ensuring the quality of production. Quality management can come in any number of different forms. Quality control usually involves the random sampling of products coming off the line (with the goal of ensuring that all products are up to standards). This may be for compliance reasons (such as in meat production) or for quality service (such as checking the seams in the leather of a Rolls Royce car). Other quality managers are concerned with the quality of the production process itself: are all employees being productive? Is there a bottleneck in the production process? These focuses on efficiency are especially important for products with low margins. In this unit, you will learn about a few of the pioneers in total quality management as well as the processes used to control quality in manufacturing and service organizations.

Completing this unit should take you approximately 5 hours.

Unit 5: Supply Chain Management (SCM)

Many of the problems associated with supply chain management are closely related to the typical problems of operations management. Instead of the question: “How should we make this?”, it becomes: “How should we get this from point A to B?” It may be best to ship the product straight from the factory to the customer, but it may be prohibitively expensive to do so. Many firms find it easier and cheaper to ship products to distribution warehouses first and distribute to customers on a more local level.

Supply chain management refers to the entire process of obtaining the raw goods from a supplier, converting those goods into products, shipping products, and placing them in front of customers. Operations management typically focuses on the production side of supply chain management, but a good manager is concerned with the entire process. In this unit, we will look at the management of firm resources on the supply side as well as the distribution of finished goods to the consumer.

Completing this unit should take you approximately 5 hours.

Unit 6: Just-In-Time and Lean Systems

Would you order a delivery pizza for dinner from a restaurant advertising delivery in 6 hours? How about a restaurant that can bring you a cold, stale pizza in only 5-minutes? To meet the consumer’s needs, the pizza shop must be able to give customers the number of pizzas they want when they want it. Preparing pizzas in advance is too wasteful because most consumers are not likely to buy a stale pizza. Meanwhile, if you take too long to deliver the pizza, you will lose customers to a more responsive competitor. The concept of just-in-time focuses on making what you need to meet customer demand only when you need it. For a pizza delivery shop, that probably means a fresh pizza at the customer’s door in around 30 minutes. This philosophy can apply to a range of operations, from simply washing a car to manufacturing a complex aircraft.

Similarly, the concept of lean manufacturing refers to eliminating waste in the manufacturing process. The Toyota Product System is the model for modern manufacturers that want to control waste. In this unit, we will look at seven types of waste and processes for controlling them. In addition, we will explore the origins of the “Just-in-Time” (JIT) philosophy and the use of pull systems to control inventory.

Completing this unit should take you approximately 4 hours.

Unit 7: Capacity Planning and Facility Layout

In the last unit, we looked at manufacturing and service processes that help companies deliver what a customer wants when they want it. Before the firm can successfully institute these processes, it must understand the requirements that determine its production capacity. In the introduction to Unit 6, we considered how a pizza shop delivers its product. Is it likely that their 30-minute delivery would cover an order for 100 pizzas? Probably not, because they have planned their production capacity based on the demand of

individual or family-sized consumers. When planning production capacity, the firm has to consider not only demand, but also the physical aspects of their facility. How close does the operation need to be to consumers? Is the facility within easy reach of the resources needed for production?

In this unit, you will learn how to use forecasting models to understand capacity requirements. We will also evaluate factors that help managers identify the optimal location for a new facility. Finally, we will conclude with a review of basic facility layout designs that maximize production efficiency.

Completing this unit should take you approximately 10 hours.

Unit 8: Work Systems Design

It seems reasonable that a worker's level of job satisfaction would influence his or her job performance. At some point in your life, you have probably performed a job task that you did not enjoy. Perhaps the work was too physically demanding or there was a problem with the location of the work area. Or perhaps the work was so monotonous that you were starved for mental stimulation. One of the ways that operations managers can impact job satisfaction is through work systems design. In this unit, we will explore how operations managers use strategies like skill variety, task significance, or work organization to enhance job performance. We will also consider models for analyzing work to eliminate unnecessary tasks and regulate the duration of each stage in a production line.

Completing this unit should take you approximately 5 hours.

Unit 9: Inventory

In a manufacturing context, inventory includes raw materials, work that is in process, and finished goods. Running out of a necessary component in the middle of production can be very costly for a manufacturer. The goal of inventory management is to balance the cost of ordering and storing material with the cost of not having that material available when it is needed. Effective inventory management combines elements of accounting, sales, and operations management. Certain aspects of this unit will feel like a review of accounting, but we will be discussing accounting from the perspective of the operation manager. There are a number of strategies for managing inventory. Because direct costs can be calculated based on the length of time an inventory is in storage, accountants and operations managers try to prevent inventory from "sitting around."

An example of one of the most successful implementers of inventory management is Walmart. Walmart uses vendor-managed inventory, meaning that its merchandise does not sit in a Walmart warehouse. Instead, it stays with the manufacturer until Walmart learns from its stores that more is needed. This keeps Wal-Mart from having to pay to store all of the products it sells. In this unit, we will consider how demand influences the operations manager's choice of inventory management system. We will also examine models for determining how much inventory to order and when to order it.

Completing this unit should take you approximately 5 hours.

Optional Course Evaluation Survey