

# “Understanding Operations Management”

## The Open University (2011)

### 1 Understanding operations management

Consider the ingredients of your breakfast this morning. Unless you live on a farm and produced them yourself, they passed through a number of different processing steps between the farmer and your table and were handled by several different organizations. Similarly, your morning newspaper was created and delivered to you through the interactions of a number of different organizations.

Every day, you use a multitude of physical objects and a variety of services. Most of the physical objects have been manufactured and most of the services have been provided by people in organizations. Just as fish are said to be unaware of the water that surrounds them, most of us give little thought to the organizational processes that produce these goods and services for our use. The study of operations deals with how the goods and services that you buy and consume every day are produced.

### 2 Operations, operations management and operations managers

#### 2.1 Operations, operations management and operations managers

Every organization has an operations function, whether or not it is called ‘operations’. The goal or purpose of most organizations involves the production of goods and/or services. To do this, they have to procure resources, convert them into outputs and distribute them to their intended users. The term operations embraces all the activities required to create and deliver an organization’s goods or services to its customers or clients.

Within large and complex organizations operations is usually a major functional area, with people specifically designated to take responsibility for managing all or part of the organization’s operations processes. It is an important functional area because it plays a crucial role in determining how well an organization satisfies its customers. In the case of private-sector companies, the mission of the operations function is usually expressed in terms of profits, growth and competitiveness; in public and voluntary organizations, it is often expressed in terms of providing value for money.

*Operations management* is concerned with the design, management, and improvement of the systems that create the organization’s goods or services. The majority of most organizations’ financial and human resources are invested in the activities involved in making products or delivering services. Operations management is therefore critical to organizational success.

## Activity 1

For each of the following businesses, identify the main output of the operation:

- Brewery
- Publisher
- Hotel
- Insurance company
- Your organization

### *Discussion*

You probably found it quite easy to identify the main output of a brewery as beer, and of a publisher as books or newspapers. However, the others are a bit trickier: a satisfied customer (hotel) and a customer bearing less financial risk (insurance company). Operations management deals with producing not only physical goods, but also satisfied customers.

An understanding of the principles of operations management is important for all managers, because they provide a systematic way of looking at an organization's processes. The need to manage manufacturing and service operations efficiently and effectively has led to a considerable increase in interest in operations management in recent years. However, the concept of operations is not new.

## **2.2 The historical development of operations management**

Operations in some form have been around as long as human endeavor itself but, in manufacturing at least, it has changed dramatically over time, and there are three major phases - craft manufacturing, mass production and the modern period. Let's look at each of these briefly in turn.

### **2.2.1 Craft manufacturing**

Craft manufacturing describes the process by which skilled craftspeople produce goods in low volume, with a high degree of variety, to meet the requirements of their individual customers. Over the centuries, skills have been transmitted from masters to apprentices and journeymen, and controlled by guilds. Craftspeople usually worked at home or in small workshops. Such a system worked well for small-scale local production, with low levels of competition. Some industries, such as furniture manufacture and clockmaking, still include a significant proportion of craft working.

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### 2.2.2 Mass production

In many industries, craft manufacturing began to be replaced by mass production in the 19th century. Mass production involves producing goods in high volume with low variety – the opposite of craft manufacturing. Customers are expected to buy what is supplied, rather than goods made to their own specifications. Producers concentrated on keeping costs, and hence prices, down by minimizing the variety of both components and products and setting up large production runs. They developed aggressive advertising and employed sales forces to market their products.

An important innovation in operations that made mass production possible was the system of standardized and interchangeable parts known as the ‘American system of manufacture’ (Hounshell, 1984), which developed in the United States and spread to the United Kingdom and other countries. Instead of being produced for a specific machine or piece of equipment, parts were made to a standard design that could be used in different models. This greatly reduced the amount of work required in cutting, filing and fitting individual parts, and meant that people or companies could specialize in particular parts of the production process.

A second innovation was the development by Frederick Taylor (1911) of the system of ‘scientific management’, which sought to redesign jobs using similar principles to those used in designing machines. Taylor argued that the role of management was to analyze jobs in order to find the ‘one best way’ of performing any task or sequence of tasks, rather than allowing workers to determine how to perform their jobs. By breaking down activities into tasks that were sequential, logical and easy to understand, each worker would have narrowly defined and repetitious tasks to perform, at high speed and therefore with low costs (Kanigel, 1999).

A third innovation was the development of the moving assembly line by Henry Ford. Instead of workers bringing all the parts and tools to a fixed location where one car was put together at a time, the assembly line brought the cars to the workers. Ford thus extended the ideas of scientific management, with the assembly line controlling the pace of production. This completed the development of a system through which large volumes of standardized products could be assembled by unskilled workers at constantly decreasing costs – the apogee of mass production.

### 2.2.3 The modern period

Mass production worked well as long as high volumes of mass-produced goods could be produced and sold in predictable and slowly changing markets. However, during the 1970s, markets became highly fragmented, product life cycles reduced dramatically, and consumers had far greater choice than ever before.

An unforeseen challenge to Western manufacturers emerged from Japan. New Japanese production techniques, such as total quality management (TQM), just-in-time (JIT) and employee involvement were emulated elsewhere in the developed world, with mixed results.

More recently, the mass production paradigm has been replaced, but there is as yet no single approach to managing operations that has become similarly dominant. The different approaches for managing operations that are currently popular include:

- *Flexible specialisation* (Piore and Sabel, 1984) in which firms (especially small firms) focus on separate parts of the value-adding process and collaborate within networks to produce whole products. Such an approach requires highly developed networks, effective processes for collaboration and the development of long-term relationships between firms.
- *Lean production* (Womack et al., 1990) which developed from the highly successful Toyota Production System. It focuses on the elimination of all forms of waste from a production system. A focus on driving inventory levels down also exposes inefficiencies, reduces costs, and cuts lead times.
- *Mass customisation* (Pine et al., 1993) which seeks to combine high volume, as in mass production, with adapting products to meet the requirements of individual customers. Mass customisation is becoming increasingly feasible with the advent of new technology and automated processes.
- *Agile manufacturing* (Kidd, 1994) which emphasizes the need for an organization to be able to switch frequently from one market-driven objective to another. Again, agile manufacturing has only become feasible on a large scale with the advent of enabling technology.

In various ways, these approaches all seek to combine the high volume and low cost associated with mass production with the product customisation, high levels of innovation and high levels of quality associated with craft production.

### 2.3 The role of the operations manager

Some people (especially those professionally involved in operations management!) argue that operations management involves everything an organization does. In this sense, every manager is an operations manager, since all managers are responsible for contributing to the activities required to create and deliver an organization's goods or services. However, others argue that this definition is too wide, and that the operations function is about producing the right amount of a good or service, at the right time, of the right quality and at the right cost to meet customer requirements.

#### Activity 2

What do you think a typical operations manager does? Take a minute or so to consider.

#### Discussion

A stereotypical example of an operations manager would be a plant manager in charge of a factory, such as an automobile assembly plant. But other managers who work in the factory – quality managers, production and inventory control managers, and line supervisors – can also be considered to be working in operations management. In service industries, managers in hotels,

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restaurants, banks and stores are operations managers. In the not-for-profit sector, the manager of a nursing home or day centre for older people is an operations manager, as is the manager of a local government tax-collection office and the manager of a charity shop staffed entirely by volunteers.

So, operations managers are responsible for managing activities that are part of the production of goods and services. Their direct responsibilities include managing both the operations process, embracing design, planning, control, performance improvement, and operations strategy. Their indirect responsibilities include interacting with those managers in other functional areas within the organization whose roles have an impact on operations. Such areas include marketing, finance, accounting, personnel and engineering.

Operations managers' responsibilities include:

- *Human resource management* – the people employed by an organization either work directly to create a good or service or provide support to those who do. People and the way they are managed are a key resource of all organizations.
- *Asset management* – an organization's buildings, facilities, equipment and stock are directly involved in or support the operations function.
- *Cost management* – most of the costs of producing goods or services are directly related to the costs of acquiring resources, transforming them or delivering them to customers. For many organizations in the private sector, driving down costs through efficient operations management gives them a critical competitive edge. For organizations in the not-for-profit sector, the ability to manage costs is no less important.

Decision making is a central role of all operations managers. Decisions need to be made in:

- designing the operations system
- managing the operations system
- improving the operations system.

The five main kinds of decision in each of these relate to:

1. the processes by which goods and services are produced
2. the quality of goods or services
3. the quantity of goods or services (the capacity of operations)
4. the stock of materials (inventory) needed to produce goods or services
5. the management of human resources.

### Activity 3

Use the matrix below to analyze your role as an operations manager. In as many of the cells in the matrix as you can, jot down an example of a decision you have made in the last month.

	<b>A Designing the operations system</b>	<b>B Managing the operations system</b>	<b>C Improving the operations system</b>
1 Processes			
2 Quality			
3 Capacity			
4 Inventory			
5 Human resources			

### Discussion

You will almost certainly have left some of the cells in the matrix blank. For example, you may not have been involved (at least in the last month) in designing the operations system, so you may not have made any decisions that belong to the cells in Column A, though you will almost certainly have found some examples to put in Column B and perhaps in Column C also. Similarly, if your area of work does not involve any stocks of materials, you will not have found any for cells in Row 4 (Inventory). However, it is likely that you will have been able to identify decisions you have made that fall in at least a third of the cells of this matrix. If so, you are fulfilling many of the roles of an operations manager.