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**Notes Overview**

Operations Management

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**Chapter 10 Summary – Operations Management**

***The Operations Function is that function of the business aimed at executing the transformation process.***

**The importance of operations management:**

- It can reduce the cost of making products or offering services
- It can increase the revenue the business receives for offering its products and services to its customers/clients
- It can reduce them amount of investment (capital) needed to manufacture the type and quantity of products or to offer the service required/
- It can provide the impetus for new innovation by using itsl solid base of operational skills and knowledge to develop new products and services

**Other reasons Op's Management are important to a business:**

- Operations management can improve productivity
- Operations management can help a business to satisfy the needs of its customers/clients more effectively
- Operations management can be decisive for the general reputation of the business

**Defining terms used in operations management:**

- The operations function is that function in the business primarily aimed at the utilisation of resources to manufacture products or render services.
- Operations management involves operations managers' activities, decisions and responsibilities that tie in with the execution of the operations function.

**Operation-management strategies and performance objectives:**

**See diagram pg 251**

All businesses formulate business objectives, and if a business intends surviving in the long term, consumers who are satisfied with the business’s products or services should be a top-priority objective. Although there are numerous customer needs that can be reduced to 6 main elements:







- Higher quality
- Lower costs
- Shorter lead time (quicker manufacturing or provision of services)
- Greater adaptability (flexibility)
- Lower variability with regard to specifications (reliability)
- High level of service (better overall service).

With these 6 customer/client requirements as a basis, operations management performance objectives can be formulated to give the business an “operations-based advantage” over other businesses. Operations management performance objectives must indicate the specific areas with the domain of the operations function that will be emphasised when products and/or services are produced or provided. The operations-management performance objectives are formulated in such a way that they are applicable to both manufacturers and service providers. To acquire operations based advantages, the following 6 general operations-management performance objectives can be followed:

- Do things right the first time
- Do things cost effectively
- Do things fast
- Make changes quickly
- Do things right every time
- Do things better

**Operations management guideline**

**Positive result**

Do things right the first time		Higher quality
Do things cost effectively		Lower cost
Do things fast		Shorter lead time
Changing things quickly		Greater Adaptability
Do things right every time		Lower variability
Do things better		Better service

**The transformation model:**

The operations function is primarily concerned with using resources (inputs) to provide outputs by means of a transformation process. Therefore the transformation model comprises 3 main components: Inputs, the transformation process itself and outputs.

See diagram 10.3 on page 254

**Inputs:**

Inputs used in the transformation process comprise both the resources that are to be transformed (processed, changed or converted) and the resources required to make the transformation possible. The resources to be transformed include the following:

- Material
- Customers/clients
- Information

The resources required to make transformation possible include:

- Human Resources
- Equipment and facilities
- Technology

**The Transformation Process:**

The transformation process converts inputs to outputs. The nature of the process is determined by what input is predominantly being processed.

**Outputs:**

The ultimate goal of any transformation process is to transform inputs into outputs. Outputs assume the form of products or services.

Characteristics of products and services:

Products produced by manufacturer	Services produced by service provider
• Physically tangible and durable	• Intangible and perishable
• Output kept in stock	• Output not kept in stock
• Little customer contact	• Plenty of client contact
• Manufactured before use	• Provision and consumption simultaneous
• Long response time	• Short response time
• Local & International markets	• Mainly local markets
• Large production Facilities	• Small service-provision facility
• Capital-intensive production	• Labour intensive
• Quality easily measurable	• Quality difficult to measure

**Different operations have different characteristics:**

While the basic purpose of all operations is similar in that they transform inputs into outputs, the processes may differ fundamentally in 4 ways:

- The volume of output may differ (amount)
- The variety of the output may differ (range)
- The variation of output may differ (demand pattern)

- The visibility of output may differ (refers to how much of the operations activities the customers experience themselves or are exposed to)

#### The classification of process types for manufacturers:

In manufacturing the most common classification system classifies different operations processes according to the volume of output and the variety of products. According to the classification system 5 main categories are identified:

- **Project Processes:** Projects represent operational processes that are highly individual and unique, but that are normally tackled on a large scale. It can take several months or years to complete such projects (i.e. constructions projects, upgrading or building of airport, road, bridge etc)
- **Jobbing Processes:** Jobbing normally represents operational processes conducted on a small scale with a low volume of output. The nature of the work is the same throughout, but the specific requirements differ from 1 task to the next. (Egg goldsmith manufacturing jewellery, each piece is usually unique)
- **Batch Processes (job lots):** In batch production a limited range of products are manufactured by the business and production occurs in batches. Similar to jobbing but doesn't have same degree of variety. i.e. batch production of domestic appliances such as kettles, toasters, irons etc.
- **Mass Processes:** Mass production is the production of products in high volume with relatively little variety. There is some variety in the product itself but the basic process of production is the same, repetitive in nature, largely predictable and easier to manage than jobbing and batch processes.
- **Continuous processes:** Continuous production is a step beyond mass production because the volumes are even greater but there is very little variety in the type of product. E.g. cement manufacturer PPS cement, ESKOM for electricity.

#### The classification of process types for service providers:

The same classification criteria used for manufacturers can be used for service providers. According to such a classification system 3 main categories can be identified:

- **Professional Services:** represent operational processes provided on a high client-contact basis, where the client is usually present within the service process for a considerable period of time. Contact often occurs on a one-to-one basis. Volume is usually low while variety of services offered high e.g. doctors, lawyers, dentists
- **Service shops:** Service shops represent operational processes where the characteristics of service provision fall between those of professional services and those of mass services. There is a fair amount of client contact & services are standardised to a degree e.g. Banks, hotels, shops etc
- **Mass services:** represent operational processes where many client transactions occur with limited client contact and nature of services provided is largely standardised e.g. post services, rail & transport services.

#### Operations Design

The nature of operations design entails two interdependent aspects:

- The design of products and services (product design)

- The design of operations product or services processes to manufacture or provide these products or services (process design)

The primary aim of operations design is to provide products and or services and processes that satisfy the needs of customers/clients in the best possible way.

### **The design of products and services:**

#### **Competitive advantage of good design:**

If products are well designed, produced and provided so that the expectations of customers are met or exceeded then business's competitive positions will be reinforced through increased sales of these products/services.

#### **The Components of products and services:**

All products and services consist of 3 interdependent components: A concept, a package and a process.

### **The stages in the design of products and services:**

- Concept generation
- The screening process
- Preliminary design
- Evaluation and improvement
- Prototype and final design

### **The design of operations processes**

#### **The design of supply networks**

In the design of a particular operations process, it is important for the entire supply network to be taken into considerations, to determine the inputs for the specific operations process and the customer needs that have to be satisfied.

#### **The layout and flow of manufacturing and service provisions facilities:**

The layout of the operations facility determines the physical arrangement of the resources used in the transformation process. Layout also determines the way in which resources such as raw materials, information and customers flow through the transformation process. The layout of a manufacturing or service provision facility entails 3 steps:

1. Selecting the process type: For manufacturers – project, jobbing, batch, mass & continuous processes. For service providers – professional services, mass services and service shops.
2. Selecting the basic layout type: 4 basic layout types:
  - The fixed position layout (cannot be shifted)
  - The process layout (flexible-flow layout); similar processes grouped together into sections
  - The product layout (line-flow layout); different processes arranged in consecutive order
  - The cellular layout (hybrid layout); specific processes placed in a cell and arranged according to either a process or a product layout.

### **The application of process technology**

Process technology refers to the machines, equipment and apparatus used in the transformation process to transform materials, information's and clients so that products can be manufactured or services provided.

### **Job design and work organisation**

The way in which human resources are managed in a business has a fundamental effect on the effectiveness of the operations function.

### **Operations Planning and Control**

#### **The nature and operations planning and control**

Operations planning and control focuses on all the activities required to put the operations process into action efficiently on a continuous basis so that products can be manufactured or services can be provided to meet the needs of customers. Reconciling the supply of products or services with the demand for them by means of planning and control activities occurs in 3 dimensions:

- Volume (quantity)
- Timing (when)
- Quality (conformity to clients expectations)

To reconcile the volume and timing dimensions with each other, 3 different but integrated activities are performed

- The loading of tasks
- The sequencing of tasks
- The scheduling of tasks

#### **Capacity planning and control**

The focus on capacity planning and control is on the provision of the manufacturing or service capacity of a particular operations process.

Capacity from an operations point of view is defined as the maximum level of value added activity over a period of time that the process can achieve under normal operating circumstances.

The nature of capacity planning and control:

Quantative data on the expected demand and required capacity to satisfy this expected demand must be obtained by applying 3 steps:

1. The total demand and required capacity must be determined
2. Alternative capacity plans must be identified, 3 options available
  - A level-capacity plan in which capacity levels are kept constant and demand fluctuations are ignored
  - A chase-demand plan in which capacity levels are adjusted according to fluctuations in demand
    - A demand-management plan in which demand is adjusted to tie in with available capacity
3. The most suitable approach to capacity planning and control must be chosen

#### **Techniques and methods during capacity planning and control**

2 techniques:

- The moving-average demand-forecasting technique (based on actual demand data over preceding periods)

- Cumulative representations of demand and capacity (a method that can be used to evaluate the effect of different capacity plans graphically)

### **Inventory and supply-chain planning and control**

Inventory from an ops mgnt perspective is defined as all stored resources required for the smooth functioning of the operations process.

### **Quality planning and control**

Quality from an Ops mgnt is defined in terms of what a customer expects of a particular product or service.

The aim of quality planning and control is to ensure that the products or services that are manufactured or provided conform to or satisfy design specifications.

### **The steps in quality planning and control:**

6 steps:

- Defining the quality characteristics of the product or service. Quality characteristics that are often used include: Functionality, Appearance, Reliability, Durability, and Serviceability & Contact.
- Measuring the quality characteristics of the product or service.
- Setting standards for each quality characteristic of the product or service
- Controlling quality against the set standards, 3 important questions
  1. Where in operations process should one check to see if standards have been satisfied?
  2. Should each product/service be checked to determine whether the standards have been met?
  3. How should inspection be conducted?
- Identifying and rectifying the causes of poor quality
- Continually improving quality

### **Operations improvement**

Different types of performance standards

- Historical performance standards
- Target performance standards
- Competitors' performance standards
- Absolute performance standards

### **Priorities for improvement**

The needs of customers provide an indication of those performance areas of particular importance to them. Ops manager's objectives should reflect the preferences of its customers.

### **Approaches to improvement**

- **Breakthrough improvement** (dramatic and large scale changes occur in the functioning of an operation process but not very regularly)
- **Continuous improvement** (more regular but smaller, incremental changes take place)

## **Failure prevention and recovery**

### **Types of failures:**

- Design failures
- Facility failures
- Staff failures
- Supplier failures
- Customer failures

Failure detection and analysis

Mechanisms to detect failures include process-monitoring, complaints and feedback questionnaires from customers.

### **Systems reliability improvement**

The causes and consequences of failures should be prevented (redesigning products or services or the processes that manufacture or provide them)

### **Recovery of failures**

When failures occur, recovery procedures and contingency plans should already have been devised and put in place to minimize the potential detrimental effects.

## **Total Quality Management**

TQM can be defined as a management's philosophy that primarily aims to satisfy the needs and expectations of customers/clients by means of high-quality products or services, and that endeavors to shift the responsibility for quality from the operations-management function to the entire business.

TQM is aimed at:

- Meeting the needs and expectations of customers
- Covering all parts of the business regardless how small
- Making every employee quality conscious and holding them responsible for their contribution to the achievement to TQM
- Identifying and accounting for all costs of quality
- Doing things right the first time
- Developing and implementing systems and procedures for quality and improvement thereof
- Establishing a continuous process for improvement

### **Implementation of TQM**

- Factors to be taken into account:
  - Integration of TQM in the overall business strategy
  - Top management's and employees' support and involvement
  - Teamwork in the improvements initiatives
  - Feedback on quality successes that have in fact been achieved
  - Creation of quality awareness
  - Training of the employees in quality techniques and methods