

Chapter 10 Operations management

1.1.	Importance of operations management	3
1.2.	Defining operations management	3
2.	Operations management model.....	3
2.1.	Operations management strategies and performance objectives.....	3
2.1.1.	Customer / client needs	3
2.1.2.	Operations management performance objectives	3
2.2.	Transformation model.....	4
2.2.1.	Inputs.....	4
2.2.2.	Transformation process	4
2.2.3.	Outputs.....	5
3.	Classification of process types	5
3.1.	For manufacturers	5
3.1.1.	5 main categories	5
3.2.	For service providers	5
4.	Operations design	6
4.1.	Nature of operations design.....	6
4.2.	Design of products and services.....	6
4.2.1.	Competitive advantage of good design	6
4.2.2.	Components of products and services	6
4.2.3.	Stages in design of products and services	7
4.3.	Design of operation processes	7
4.3.1.	Design of supply networks	7
4.3.2.	Layout and flow of manufacturing and service provision facility	7
5.	Operations planning and control.....	8
5.1.	Nature of operations planning and control	8
5.2.	Capacity planning and control.....	8
5.2.1.	Capacity.....	8
5.2.2.	Nature of capacity planning and control	8
5.2.3.	Techniques and methods used in capacity planning and control.....	8
5.3.	Quality planning and control	9
5.3.1.	Quality	9
5.3.2.	Nature of quality planning and control.....	9
5.3.3.	Steps in quality planning and control.....	9
6.	Operations improvement.....	9
6.1.	Nature of operations improvement.....	9
6.1.1.	Different types of performance standards	9

- 6.1.2. Priorities for improvement 9
- 6.1.3. Approached to improvement 9
- 6.2. Failure prevention and recovery 10
 - 6.2.1. Different types of failures 10
 - 6.2.2. Failure detection and analysis 10
 - 6.2.3. Systems reliability improvement 10
 - 6.2.4. Recovery of failures 10
- 6.3. Total quality management 10
 - 6.3.1. Implementation of TQM 10

- Business transforms input from environment into output to the environment
- Operations function – executing transformation process
- Operations function and operations management are directly involved with creating products and providing services in order to realize the objective of business

1.1. Importance of operations management

- Can reduce costs of making products or offering services
- Can increase revenue business receives for offering its products and services to consumer
- Can reduce the amount of investment (capital) needed to manufacture the type and quantity of products or to offer the service required
- Can provide the impetus for new innovation by using its solid base of operational skills and knowledge to dev new products and services
- Operations management can improve productivity
- Can help a business to satisfy the needs of the consumer more effectively
- Can be decisive for the general reputation of the business

1.2. Defining operations management

- Management of transformation process whereby products are manufactured or services rendered
- That function primarily aimed at the utilization of resources to manufacture products or render services
- Operations managers – directly responsible for managing operations functions
- Involves operations management activities decisions, and responsibilities that tie in with execution operations management

2. Operations management model

2.1. Operations management strategies and performance objectives

2.1.1. Customer / client needs

- Higher quality
- Lower costs
- Shorter lead times
- Greater adaptability
- Lower variability wrt specifications
- High level of service
- Operations management performance objective must indicate specific areas within the domain of operations function that will be emphasized when products / services are produced / delivered
- Objective must be applicable to manufacturers and services providers

2.1.2. Operations management performance objectives

- Do things right the first time – higher quality

- Do things cost effectively – lower cost
- Do things fast – shorter lead time
- Make changes quickly – greater adaptability
- Do things right every time – lower variability
- Do things better – better service

2.2. Transformation model

- Inputs
- Transformation process
- Outputs

2.2.1. Inputs

- **Material**
 - Processed material like steel in car manufacturing
 - Unprocessed material like gold in mine
 - Services provider eg hairdresser – shampoo and tinting
- **Customers and clients**
 - When client is subject being transformed, dental treatment
 - Recreational facilities – gym
- **Information**
 - Primary input when info is processed into news for newspaper
 - Secondary input when consumer preferences (eg car color) is used to manufacture cars
- **Human resources**
 - Both markets physically involved in transformation process and those in supervisory capacity
- **Equipment and facilities**
 - Manufacturers – factories and machinery
 - Banks – offices and computers
- **Technology**
 - Used to enable transformation process to function more efficiently

2.2.2. Transformation process

- Converts inputs into outputs
- Nature of process determined by what type of input is processed
- When materials are transformed – change physical characteristics
- Services providers eg material changing location – delivery business
- Information transformation when info changes in composition or shape – auditors report
- Changes ownership – market research publication
- Merely stored – library
- Customer / client transformation – physical eg hairdressing
- Physiological – medical treatments
- Emotional – entertainment
- Location eg airlines

2.2.3. Outputs

- Assume the form of products and services
- See table 10.1 on page 256

3. Classification of process types

3.1. For manufacturers

- Classified according to:
 - Volume of output
 - Variety of products

3.1.1. 5 main categories

- Project process
 - Highly individual and unique
 - Tackled on large scale
 - Construction projects eg building and upgrading airports
- Jobbing process
 - Conducted on a small scale
 - Low volume of output
 - Nature of work is the same but specific requirements differ from one task to next
 - Jeweler, printing of wedding invitations
- Batch processing – job lots
 - Limited range of products
 - Production in batches
 - Manufacturer of household appliances eg TV and toaster
- Mass processes
 - Production in high volumes
 - Relative little variety
- Continuous processes
 - Greater volumes than mass production
 - Very little variety
 - Eg Eskom and Sasko

3.2. For service providers

- Professional services
 - Processes provided on a high client contact basis
 - Contact on one to one basis
 - People orientated
 - Volume of presentation low
 - Variety of services high
 - Dr, dentist, attorney
- Service shops

- Process where characteristics are between proff services and mass services
- Fair amount of client contact
- Services standarised
- Also adapted to accommodate unique needs
- Amount of clients serviced is greater
- Mass services
 - Many client transactions
 - Limited client contact
 - Nature of services largely standarised
 - Variety low
 - Eg post and telecommunications, air transport

4. Operations design

4.1. Nature of operations design

- Design of products and services
- Design of operations products or services processes to manufacturer or provide these products and services
- Design as operations activity helps to achieve operations main objectives wrt
 - Quality
 - Cost
 - Lead time
 - Adaptability
 - Variability
 - Service

4.2. Design of products and services

4.2.1. Competitive advantage of good design

- Design of products begins and ends with consumer
- Products initially designed to satisfy a need
- If expectations are realized competitive position will be reinforced

4.2.2. Components of products and services

- Concept
 - Set of expected benefits the consumer purchases
 - Set of benefits a constomer has – product concept
 - Set of benefits a client has – services concept
- Package
 - Car – tangible
 - Guarantee – intangible
 - Customer buys a combination of services and products
 - Services can not be inventoried eg miss a flight the ticket lapses
 - Services involve direct interaction between customer and process
- Process
 - Necessary to create package of product or service

4.2.3. Stages in design of products and services

- Design of products or services results in full detailed specification of products or services
- Information to be used about concept, package and process
- To obtain this info certain steps need to be followed:
 - Concept generation
 - Screening process
 - Preliminary design
 - Evaluation and improvement
 - Prototype and final design

4.3. Design of operation processes

4.3.1. Design of supply networks

- Includes:
 - Specific operations process
 - Suppliers of material and services
 - Intermediaries
 - Final customers / clients

4.3.2. Layout and flow of manufacturing and service provision facility

- Layout = physical arrangement of resources
- First characteristic of operational process
- Layout determines flow of processes
- 3 steps:
 - Selecting process type
 - Selecting basic layout type
 - Making a detailed design of layout

Selecting process type

- Process types for manufacturers
 - Project
 - Jobbing
 - Batch
 - Mass
 - Continuous
- Process types for service providers
 - Professional services
 - Mass services
 - Service shops

Selecting basic layout type

- Fixed position layout
- Process layout – flexible flow layout
- Product layout – line flow layout
- Cellular layout – hybrid layout

Making detailed design layout

- Final step in layout

5. Operations planning and control

5.1. Nature of operations planning and control

- Focuses on all activities required to put the operations process into action efficiently on a continuous basis so that products can be manufactured or services provided to meet the needs of customers and clients
- Reconciling the supply of products or services with demand for them occur in 3 dimensions:
 - Volume – quantity of product or service
 - Timing – when it has to be manufactured / provided
 - Quality – whether it consistently conforms to customers expectations
- To reconcile volume and timing
 - Loading of tasks
 - Sequencing of tasks
 - Scheduling of tasks

5.2. Capacity planning and control

5.2.1. Capacity

- Maximum level of value added activity over a period of time that the process can achieve under normal operating circumstances

5.2.2. Nature of capacity planning and control

- Quantitative data on expected demand and required capacity to satisfy expected demand obtained by applying 3 steps:
 - Total demand and required capacity must be determined
 - Alternative capacity plans must be identified
 - Level capacity plan in which capacity levels are kept constant and demand fluctuations are ignored
 - Chase demand plan in which capacity levels are adjusted according to fluctuations
 - Demand management plan in which demand is adjusted to tie in with available capacity
 - Most suitable approach to capacity planning must be chosen

5.2.3. Techniques and methods used in capacity planning and control

- Moving average demand forecasting technique
- Cumulative representations of demand and capacity

5.3. Quality planning and control

5.3.1. Quality

- Consistent conformance to customers / clients expectations
- Quality gap = difference between expected quality and perceived quality

5.3.2. Nature of quality planning and control

- Aim is to ensure that products and services that are manufactured / provided conform to or satisfy design specification

5.3.3. Steps in quality planning and control

- Defining quality characteristics of products and services
 - Functionality
 - Appearance
 - Reliability
 - Durability
 - Serviceability
 - Contact
- Measuring quality characteristics of products or services
- Setting standards for each quality characteristic of products or services
- Controlling quality against the set standards
 - Where in operations process should one check to see if standards are satisfied
 - Should each product/service be checked
 - How should inspection be conducted
- Identify and rectify causes for poor quality
- Continuously improving quality

6. Operations improvement

6.1. Nature of operations improvement

6.1.1. Different types of performance standards

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

6.1.2. Priorities for improvement

- Should be determined
- Take into consideration needs and preferences of customers

6.1.3. Approached to improvement

- Breakthrough improvement

- Continuous improvement (kaizen)

6.2. Failure prevention and recovery

6.2.1. Different types of failures

- Design failures
- Facility failures
- Staff failures
- Supplier failures
- Customer / client failures

6.2.2. Failure detection and analysis

- Process monitoring
- Complaints and feedback questionnaires

6.2.3. Systems reliability improvement

- Causes and consequences of failures should be prevented
- Training sessions

6.2.4. Recovery of failures

- Recovery procedures and contingency plans should be in place

6.3. Total quality management

- TQM = management philosophy that primarily aims to satisfy the needs and expectations of customers by means of high quality products and that endeavors to shift responsibility for quality from operations management to entire business
- TQM is aimed at:
 - Meeting the needs and expectations of customer
 - Covering all parts of business no matter how small
 - Making each employee quality conscious and holding them responsible for contributing to achieve TQM
 - Identifying and accounting for all costs of quality
 - Doing things right the first time
 - Dev and implementing systems and procedures for quality and improvement thereof
 - Establishing a continuous process for improvement

6.3.1. Implementation of TQM

- Factors to take into consideration:
 - Integration of TQM in overall business strategy
 - Top management and employee support and involvement
 - Teamwork in improvement initiatives
 - Feedback of quality successes that have been achieved

- Creation of quality awareness
- Training of employee quality techniques and methods