

Module – 1

Operations Management Basics

And

Operations Strategy

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(As per Syllabus of MBA (SCM), MBA(HRM)
Semester – II)

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Part - I

Operation Management - Introduction

Operation Management is a part of management sciences. Operation Management is concerned with the production of quality goods and services and ensures that the business operations are performed smoothly, efficiently and effectively.

It is a field of management that deals with effective planning, scheduling, use and control of a manufacturing or service organization.

Operations management is the business function that plans organizes, coordinates and controls, the resource needed to produce a company's goods and services.

Operations Management is the process whereby resources, flowing within a defined system, are combined and transformed by a controlled manner to add value in accordance with policies communicated by management.

Operation Management – Definitions

According to S.Buffa 'production or operation management deals with decision making related to production process so that the resulting goods and services are produced according to specifications, in the amount and by the schedule demanded and at a minimum cost'.

The Association of Operation Management defines operation management as 'the field of study that focuses on the effective planning ,scheduling, use and control of manufacturing or service organizations through the study of concepts from design engineering, industrial engineering, MIS, quality management, production management, industrial management and other functions as they affect the organization'.

Operation management is the business function that manages that part of a business that transforms raw materials and human inputs in to goods and services of higher value. Operation management is a business activity that deals with the production of goods and services. The term operation includes management of materials, machines, and inventory control and storage functions. Operations management includes a set of activities performed to manage the available resources in an efficient manner in order to convert inputs in to desired outputs.

The value addition to an input can be done in the following ways. They are mentioned below:

1. Alteration

It refers to the transformation of the state of input. This transformation can be a physical change in the input to produce goods.

2. Transportation

It refers to physical movement of goods from one location to another.

3. Storage

It refers to preserving goods in a protected environment.

4. Inspection

It refers to the verification of and confirmation towards the requirements of an entity.

All the above activities in one way or another are making a product more useful. The operations managers have the prime responsibility for processing inputs into outputs. They must bring together the materials, capacity and knowledge available for the purpose achieving its production objectives. The definition of the operations Management contains the concepts such as Resources, Systems, transformation and Value addition Activities etc. A brief explanation about such words is given below:

1. Resources

Resources are in the forms of the human, material and capital inputs. Human resources are the key resources of an organization. By using the intellectual capabilities of people, managers can multiply the value of their employees. Material resources are the physical inputs, which are needed for production.

2. Systems

Systems are the arrangement of components designed to achieve objectives. The business systems are subsystem of large social systems. Business system contains subsystem such as personnel, engineering, finance and operations. The ability of any system to achieve its objective depends on its design and control mechanism. System design is a predetermined arrangement of components. It establishes the relationships between inputs, transformation activities and outputs in order to achieve the system objectives. System control consists of all actions necessary to ensure that activities conform to preconceived plans.

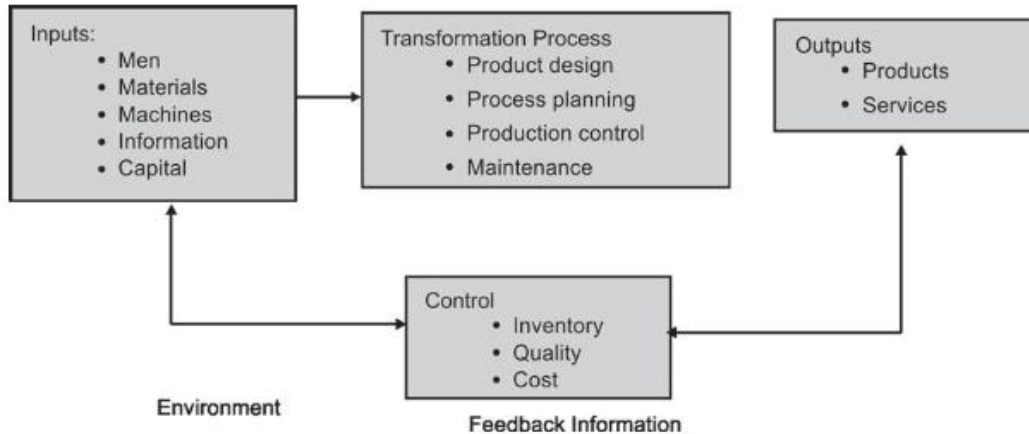
3. Productivity

The objective of combining resources is to transform the inputs into goods and services having a higher value than the original inputs. The effectiveness of the production factors in the transformation process is known as productivity. The productivity refers to the ratio between values of output per work hour to the cost of inputs.

Operation Management – As a Transformation Process

Operation is concerned with the transformation of inputs into the required output or services. Management is the continuous process, which combines and transforms various resources used in the operations system of the organization into value added services.

Operation Management is the set of interrelated management activities, which are involved in manufacturing of certain products or services.



Objectives of Operations Management

The objectives of the operations management are given below:

- 1. Right Quality:** Quality is the important factor, which should be considered at the time of manufacturing process. All efforts should be taken to ensure the quality of the manufactured goods.
- 2. Right Quantity:** The manufacturing organization should produce the goods in right number. If they are produced in excess of demand the capital will block up in the form of inventory. If the quantity is produced in short of demand, it leads to shortage of products.
- 3. Timeliness:** Timeliness of delivery is one of the important factors to judge the effectiveness of production department. The production department has to make the optimal utilization of resources to achieve its objectives.
- 4. Low Manufacturing Cost:** Manufacturing costs are determined before the product is actually produced. Hence, all attempts should be taken to produce the products at pre-established cost so as to reduce the variation between actual and standard cost.

Scope of Operations Management

As stated earlier, Operations Management is concerned with the conversion of inputs into outputs using physical resources so as to provide the desired utilities to the customers. It involves a number of well planned activities.

Following are the activities that come under Production and Operations Management functions:

1. Location of facilities.
2. Plant layouts and Material Handling.
3. Product Design.
4. Process Design.
5. Production and Planning Control.
6. Quality Control.
7. Materials Management.
8. Maintenance Management

1. *Location facilities*

Location of the proposed factory building is an important consideration in operation management. It is an important strategic level decision-making for an organization. It deals with the questions such as ‘where our main operations should be based?’ The selection of location is a key-decision because large amount of investment is required in building plant and machinery. An improper location of plant may lead to waste of all the investments made in plant and machinery. Hence, location of plant should be based on the company’s future plan about expansion, diversification, nature of sources of raw materials and many other factors. The very purpose of the location study is to identify the optimal location facility that will results in the greatest advantage to the organization.

2.1. *Plant layout*

Plant layout refers to the physical arrangement of facilities. It is the configuration of departments, work centres and equipment’s in the inputs conversion process. The objective of the plant layout is to design a physical arrangement that meets the required output quality and quantity most economically. According to James More ‘Plant layout is a plan of an optimum arrangement of facilities including personnel, operating equipment, storage space, material handling equipment and all other supporting services along with the design of best structure to contain all these facilities’.

2.2. *Material handling*

Material Handling refers to the moving of materials from the store room to the machine and from one machine to the next machine during the production process. It is the art and science of moving, packing and storing of products in any form. Material cost can be reduced by judicious selection of materials and its proper storage. Material handling devices increases the output, improves quality, speeds up the deliveries and decreases the cost of production. Hence, material handling should be a prime task in the designing of new projects.

3. *Product design*

Product design deals with conversion of ideas into reality. Every business organization has to design, develop and introduce new products as a commercial strategy. Developing the new products and launching them in the market are the biggest problems faced by the organizations. The entire process of need identification to physical manufactures of product involves three functions - Design, Product Development, and manufacturing. Operation management has the responsibility of selecting the processes by which the product can be produced.

4. *Process design*

Designing of manufacturing process is another functional area of operation management. It deals with how the process required to produce a product is selected. These decisions encompass the selection of a process, choice of technology, process flow analysis and layout of the facilities. The major consideration in process design is to analyze the workflow for converting raw materials into final products.

5. *Production Planning and Control*

Production planning and control can be defined as the process of planning the production in advance, setting the exact route of each item, fixing the starting and finishing dates for each item, to give production orders to shops and to follow-up the progress of products according to orders. The principle of production planning and control lies in the statement 'First Plan Your Work and then Work on Your Plan'. Main functions of production planning and control include Planning, Routing, Scheduling, Dispatching and Follow-up.

Planning is deciding in advance what to do, how to do it, when to do it and who is to do it. Planning bridges the gap from where we are and to where we want to go. It makes it possible for things to occur which would not otherwise happen.

Routing is the process of selection of path, which each part of the product will follow. Routing determines the most advantageous path to be followed for department to department and machine to machine till raw material gets its final shape.

Scheduling determines the time programme for the operations. Scheduling may be defined as the fixation of time and date for each operation as well as it determines the sequence of operations to be followed.

Dispatching is concerned with the starting the processes. It gives authority so as to start a particular work, which has been already been planned under Routing and Scheduling. Therefore, dispatching is the release of orders and instruction for the starting of production.

Follow-up is the process of reporting daily progress of work in each shop in a prescribed proforma and to investigate the causes of deviations from the planned performance and to take necessary actions.

6. *Quality Control*

Quality Control may be defined as a system that is used to maintain a desired level of quality in a product or service. It is a systematic control of various factors that affect the quality of the product. Quality Control aims at prevention of defects at the source, relies on effective feedback system and corrective action procedure. Quality Control ensures that the product of uniform acceptable quality is manufactured. It is the entire collection of activities, which ensures that the operation will produce the optimum quality products at minimum cost.

The main objectives of Quality Control are:

- To produce qualitative items
- To reduce companies cost through reduction of losses due to defects.
- To produce optimal quality at reduced price.
- To ensure satisfaction of customers with productions or services or high quality level, to build customer good will, confidence and reputation of manufacturer.
- To make inspection prompt to ensure quality control.
- To check the variation during manufacturing.

7. *Materials Management*

Materials Management is that aspect of operation management function, which is concerned with the acquisition, control, and use of materials needed and flow of goods and services connected with the production process. The main objectives of Material Management are given below:

- To minimize material cost.
- To purchase, receive, transport and store materials efficiently.
- To reduce costs through simplification, standardization, value analysis etc.
- To identify new sources of supply and to develop better relations with the suppliers.

- To reduce investment made in the inventories and to develop high inventory turnover ratios.

8. *Maintenance Management*

Equipment and machinery are very important parts of the total production system. Therefore, their efficient usage is very mandatory. It is very important to see that the organization maintains plant and machinery properly. The main objectives of Maintenance Management are given below:

- To reduce breakdown of machineries
- To keep the machines and other facilities in a good condition.
- To ensure the availability of the machines, buildings and services required by other sections of the factory also.
- To keep the plant in good working condition.

History of Operations Management

The traditional view of manufacturing management began in eighteenth century when Adam Smith recognized the economic benefits of specialization of labor. He recommended breaking of jobs down into subtasks and recognizes workers to specialized tasks in which they would become highly skilled and efficient. In the early twentieth century, F.W. Taylor implemented Smith's theories and developed scientific management. From then till 1930, many techniques were developed prevailing the traditional view. Production Management became the acceptable term from 1930s to 1950s. As F.W. Taylor's works become more widely known, managers developed techniques that focused on economic efficiency in manufacturing. Workers were studied in great detail to eliminate wasteful efforts and achieve greater efficiency. At the same time, psychologists, socialists and other social scientists began to study people and human behavior in the working environment. In addition, economists, mathematicians, and computer socialists contributed newer approaches. With the 1970s emerged other two distinct changes. The most obvious of these, reflected in the new name Operations Management was a shift in the service and manufacturing sectors of the economy. As service sector became more prominent, the change from 'production' to 'operations' emphasized the broadening of field to service organizations. The second, more suitable change was the beginning of an emphasis on synthesis, rather than just analysis, in management practices.

A brief account of development of operations and production management is given below:

Year	Contribution	Contributors
1776	Specialization of labour in manufacturing	Adam Smith
1799	Interchangeable parts, cost accounting	Eli Whitney & others
1832	Division of labour by skill; assignment of jobs by Skill; basics of time study	Charles Babbage
1900	Scientific management time study and work study Developed; dividing planning and doing of work	Frederick W.Taylor
1900	Motion of study of jobs	Frank B. Gilbreth
1901	Scheduling techniques for employees, machines Jobs in manufacturing	Henry L. Gantt
1915	Economic lot sizes for inventory control	F.W. Harris
1927	Human relations; the Hawthorne studies	Elton Mayo
1931	Statistical inference applied to product quality: quality control charts	W.A. Shewart
1935	Statistical Sampling applied to quality control: inspection sampling plans	H.F. Dodge & H.G. Roming
1940	Operations research applications in world war II	P.M. Blacker & others
1946	Digital Computer	John Mauchilly and J.P. Eckert
1950	Mathematical programming, on-linear and stochastic processes	A. Charnes, W.W. Cooper& others
1960	Organisational behaviour: continued study of people at work	L. Cummings, L. Porter
1970	Integrating operations into overall strategy and policy Computer applications to manufacturing, scheduling, and control, Material Requirement Planning (MRP	W. Skinner J.Orlicky & G. Wright
1980	Quality and productivity applications from Japan: robotics, CAD-CAM	W.E. Deming & J. Juran

Objectives of Operation Management

Operation Management involves management of the entire process responsible for converting inputs into outputs. The following are the objectives of Operations Management.

1. To provide customer service

The main objective of any operating management systems is to utilize resources judiciously for the satisfaction of customer needs and wants. Therefore, customer satisfaction is a key objective of operations management. Operation management focuses on providing the right products at a right price at the right time. Hence, this objective will influence the operations manager's decisions to achieve the required customer service.

2. Effective utilization of resources

Resources that are used in the business organization must be carefully utilized. Inefficient use of resources or inadequate customer service leads to commercial failure of an organization. Operations management is concerned essentially with the utilization of resources. It aims at obtaining maximum output from the available resources with minimum cost.

3. To reduce cost of production

Operation management aims at reduction in the cost of production of goods and services. The cost per unit of the product has to be set properly and all efforts should be taken to control the actual cost to pre-determined cost of production. Cost can be classified in to fixed cost and variable cost. The variable cost changes with every level of production. This variable cost can be checked by means of inventory and labor control techniques.

4. To improve product quality

Quality control and maintenance are the two important objectives of operations management. Quality control consists of all those activities, which are designed to define, maintain and control specific quality of products within reasonable limits. It is the systematic regulation of all variables affecting the goodness of the final product. In other words, quality control involves determination of quality standards and its actual measurement .It is necessary to ensure that the established standards are practiced and maintained. It does not attempt to achieve the perfect quality but to secure satisfactory or reasonable quality at a reasonable level of cost.

5. To fix time schedule

Another important objective of operation management is to establish time schedule for various operation activities. The schedule fixation includes the operating cycle time, inventory turnover rate, machine utilization rate, capacity utilization etc..

6. Proper utilization of Machinery

Operation management has to take number of decisions with regard to machinery and equipment. New machines should be installed and the old machines are to be replaced. It has to ensure judicious utilization of machinery and equipment.

7. Material control

Based on the sales forecast and production plans, the materials planning and control is done. This involves estimating the individual requirements of parts, preparing materials budget, forecasting the levels of inventories, scheduling the orders and monitoring the performance in relation to production and sales.

Relationship of Operation Management with other Functional Areas

An organizations function can be broadly divided into:

1. Finance
2. Operation
3. Marketing

Operation as a function of management has relationships with marketing, finance, engineering and other functional areas. Finance department is concerned with securing adequate financial resources for the organization and its proper utilization. Allocation of the financial resources throughout the organization is the major function of finance department including operations department. Marketing department is responsible for identification of needs and wants of the prospective customers and developing a suitable marketing plan.

In short, operation is a key activity in an organization, which is linked with marketing and financial activities. For the successful functioning of the organization, co-operative actions of all section of the organization are needed. All functional departments have to work together. Here, operational management is central to the functioning of all other parts of organization. There should be functional collaboration among different departments. For this purpose information sharing between these departments is essential. In short operation management is the business function that plans, organizes, coordinates, and controls the resources needed to produce a company's products and services. For ensuring this, the co-operation and support from all other department of the organization are essential.

Material handling equipment

The material handling is an important activity in the operations system. The speed of the material flow across the supply chain depends on the type of the material handling equipment is used. In the logistics operation the material handling system is designed in and around the warehouse. The various operation activities like the unloading of incoming material from transport equipment, moving the unloaded material to the assigned storage place, lift the material from its storage place

during order picking, move the material for inspection and packing, and load the packages on to the transport vehicle. These operations are performed using manual, mechanized controlled material handling equipment's.

The following are some of the material handling equipment's commonly used

1. Lifting Equipment

Lifting and transport equipment is used to move product around the production facility, from loading bay to storage, from storage to production, around production, from production to storage, and from storage to loading bay. Equipment that falls into this category is fork lift trucks, order picking trucks etc..

2. Storage Equipment

Storage equipment is used to store materials, components and assemblies. The level of complexity of this type of equipment is wide ranging, from a welded cantilever steel rack to hold lengths of stock materials to a powered vertical carousel system.

3. Automated Handling Equipment

Manufacturers of automated handling equipment produce automated guide vehicles, storage and retrieval equipment and product sortation equipment. The level of automation varies depending on the handling requirements. Fully automated handling systems ensure that the materials are delivered to the production line when required without significant manual intervention.

4. Robotics

The usage of Robotics applications and versatility has increased dramatically. In manufacturing applications, robots can be used for assembly work, process such as painting, welding, etc. and for material handling. More recently robots are equipped with sensory feedback through vision and tactile sense.

Manufacturing and Non-Manufacturing Operations

On the basis nature of operations the organizations can be divided into:

1. Manufacturing organizations
2. Non-manufacturing organizations

The following are the differences between manufacturing organizations and non-manufacturing organizations:

1. Manufacturing organization produces the goods that are tangible in nature. On the other hand service organizations render service to the customers instead of tangible products.

2. The products of manufacturing units can be stored in physical form. But the products of non-manufacturing organization cannot be stored.
3. In manufacturing organization, most of the customers have no direct contact with the operations. On the other hand, in the case of service organizations the customers are present during the creation of the service.

Difference between Goods and Services

goods	service
Goods are tangible	Services are intangible
Goods can be stored and transported	Services cannot be produced beforehand
They are produced in a factory environment	Services are produced in a market environment
Goods are mainly standardised	Services are often customised
Quality is inherent in the product	Quality is inherent in the process

Concept of Production and Production System

Production is the step-by-step conversion of one form of material into another form through continuous process to create the utility of the product to the user. Production is a value addition process. Edwood Buffa defines production as ‘a process by which goods and services are created’. Production function is concerned with the transformation of a range of inputs into the required outputs .For example, manufacturing of standardized products like, car, motor cycle, radio, television, soaps, etc.

The production system is that part of an organization, which produces goods of an organization. It is a planned and integrated activity whereby resources are transformed in a controlled manner to add value for the product. The production system has the following features:

1. Production is a well organized activity with pre-established objectives.
2. The production system converts the various inputs into outputs.
3. Production function is integrated with other activities of the organization.
4. Feedback system is necessary to control and improve the system performance.
5. It is a continuous process.

Concept of Production Management

Production management is a process of planning, organizing, directing and controlling the activities of the production function. It combines and transforms various resources used in the production subsystem of the organization into value added products. Production management deals with decision-making related to production processes so that the resulting goods or services are produced according to specifications, in the amount and by the schedule demanded and out of minimum cost.

Part - II

Operations Strategy – Definition

Operations strategy is to provide an overall direction that serves the framework for carrying out all the organization's functions.

According to Slack and Lewis, operations strategy holds the following definition:

“Operations strategy is the total pattern of decisions which shape the long-term capabilities of any type of operations and their contribution to the overall strategy.”

Operations strategy is the tool that helps to define the methods of producing goods or a service offered to the customer

Strategy and Operations Strategy

Strategy

Strategy includes: Setting broad objectives that direct an enterprise towards its overall goal; Planning the path that will achieve these goals; Stressing long term rather than short term objectives; Dealing with the total picture rather than stressing individual activities; Being detached from, and above the confusion and distractions of day to day activities.

Strategic decisions refer to those decisions which are widespread in their effect on the organization to which the strategy refers, define the position of the organization relative to its environment and move the organization closer to its long term goals.

Strategy is more than a single decision; it is the total pattern of the decisions and actions that influence the long term direction of the business.

Observing the total pattern of decisions gives an indication of the actual strategic behavior.

Operations Strategy

Operations strategy concerns the pattern of strategic decisions and actions which set the role, objectives and activities of the operation.

Operations are the resources that create products and services. Operational is the opposite of strategic, meaning day to day and detailed. One can examine both the operational and strategic aspects of operations. It is also conventional to distinguish between the content and the process of operations strategy.

The content of operations strategy is the specific decisions and actions which set the operations role, objectives and activities. The process of operations strategy is the method that is used to make the specific content decisions.

From Implementing to Supporting to Driving Strategy

Most businesses expect their operations strategy to improve operations performance over time. In doing this they should be progressing from a state where they are contributing very little to the competitive success of the business through to the point where they are directly responsible for its competitive success. This means that they should be able to in turn master the skills first to implement, then support and then drive the operations strategy.

Implementing Business Strategy

The most basic role of operations is to implement strategy. Most companies will have some kind of strategy but it is the operation that puts it into practice. Without effective implementation even the most original and brilliant strategy will be rendered totally ineffective.

Supporting Business Strategy

Support strategy goes beyond simply implementing strategy. It means developing the capabilities which allow the organization to improve and refine its strategic goals.

Driving Business Strategy

The most difficult role of operations strategy is to drive strategy by giving it a unique and long term advantage.

Hayes and Wheelwright's Four Stages of Operations Contribution

The ability of any operation to play these roles within an organization can be judged by considering the organizational aims or aspirations of the operations function.

Hayes and Wheelwright of Harvard University developed a four stage model which can be used to evaluate the role and contribution of the operations function. The model traces the progression of the operations function from what is the largely negative role of stage 1 operations to becoming the central element of competitive strategy in the excellent stage 4 operations.

Stage 1: Internal Neutrality

The very poorest level of contribution by the operations function. It is holding the company back from competing effectively.

It is inward looking and at best, reactive with very little positive to contribute towards competitive success.

Paradoxically its goal is to be ignored as at least then it isn't holding the company back in anyway. It attempts to improve by avoiding making mistakes.

Stage 2: External Neutrality

The first step of breaking out of stage 1 is for the operations function to begin comparing itself with similar companies or organizations in the outside market. It is measuring itself against competitor's performance and trying to implement best practice.

Stage 3: Internally Supportive

Operations are amongst the best in the market. However, still aspire to be clearly and unambiguously the very best in the market. They achieve this by gaining a clear view of the companies' competitive or strategic goals and supporting it by developing appropriate operations resources.

Stage 4: Externally Supportive

The company views the operations function as providing the foundation for its competitive success. Operations look to the long terms.

It forecasts likely changes in market and supply and it develops the operations based capabilities which will be required to compete in future market conditions.

Operations are innovative, creative and proactive and are driving the company's strategy by being one step ahead of competitors.

Perspectives on Operations Strategy

Authors have slightly different views and definitions of operations strategy. Between them four perspectives emerge, viz,

- Operations strategy is a bottom up activity where operations improvements cumulatively build strategy.
- Operations strategy involves translating market requirements into operations decisions.
- Operation strategy is a top down reflection of what the whole group or business wants to do.
- Operations strategy involves exploiting the capabilities of operations resources in chosen markets.

Together they provide some idea of the pressures which go to form the content of operations strategy.

Managing Strategy

After collectively considering the products and services demanded by customers, strengths and weaknesses of competitors, the environment, and the firm's own strengths, weaknesses, cultures, and resources, proficient firms can formulate their vision as expressed through the mission

statement. This statement expresses the organization's values and aspirations; basically its reason or purpose for existence. Based on this mission statement the firm will formulate its business strategy. This business strategy is a long-term plan for accomplishing the mission set forth in the mission statement. Each function within the business can then derive its own strategy in support of the firm's overall business strategy (financial strategy, marketing strategy, and operations strategy).

Operations strategy is the collective concrete actions chosen, mandated, or stimulated by corporate strategy. It is, of course, implemented within the operations function. This operations strategy binds the various operations decisions and actions into a cohesive consistent response to competitive forces by linking firm policies, programs, systems, and actions into a systematic response to the competitive priorities chosen and communicated by the corporate or business strategy. In simpler terms, the operations strategy specifies how the firm will employ its operations capabilities to support the business strategy.

Operations strategy has a long-term concern for how to best determine and develop the firm's major operations resources so that there is a high degree of compatibility between these resources and the business strategy. Very broad questions are addressed regarding how major resources should be configured in order to achieve the firm's corporate objectives. Some of the issues of relevance include long-term decisions regarding capacity, location, processes, technology, and timing.

The achievement of world-class status through operations requires that operations be integrated with the other functions at the corporate level. In broad terms, an operation has two important roles it can play in strengthening the firm's overall strategy. One option is to provide processes that give the firm a distinct advantage in the marketplace. Operations will provide a marketing edge through distinct, unique technology developments in processes that competitors cannot match.

The second role that operations can play is to provide coordinated support for the essential ways in which the firm's products win orders over their competitors, also known as distinctive competencies. The firm's operations strategy must be conducive to developing a set of policies in both process choice and infrastructure design (controls, procedures, systems, etc.) that are consistent with the firm's distinctive competency. Most firms share access to the same processes and technology, so they usually differ little in these areas. What is different is the degree to which operations matches its processes and infrastructure to its distinctive competencies.

Key Success Factors

Industries have characteristics or strategic elements that affect their ability to prosper in the marketplace (i.e., attributes, resources, competencies, or capabilities). The ones that most affect a firm's competitive abilities are called key success factors (KSFs). These KSFs are actually what the firm must be competent at doing or concentrating on achieving in order to be competitively and financially successful; they could be called prerequisites for success. In order to determine their own KSFs, a firm must determine a basis for customer choice. In other words, how do customers differentiate between competitors offering the same or similar products or services and how will the firm distinguish itself from these competitors? Once this is determined, the firm has to decide what resources and competitive capabilities it needs in order to compete successfully, and what will it take to achieve a sustainable competitive advantage. These KSFs can be related to technology, operations, distribution, marketing, or to certain skills or organizational capability. For example, the firm may derive advantages from superior ability to transform material or information (technology or operations), to quickly master new technologies and bring processes online (technology or organizational capability), or to quickly design and introduce new products, service a broad range of products, customize products or services on demand, or provide short lead times (skills).

The set of KSFs that are delegated totally or substantially to the operations function has been termed the *manufacturing mission*. It represents what top management expects from operations in terms of its strategic contribution. All decisions made relative to system design, planning, control and supervision must aim at accomplishing the manufacturing mission. As such, the manufacturing mission is the principal driver of the operations function and gives it its reason for existence. All world-class manufacturers have an explicit, formal manufacturing mission.

From the manufacturing mission the operations function derives its distinctive competencies (also called competitive priorities or competitive weapons). Distinctive competence is defined as the characteristic of a given product/service or its producing firm that causes the buyer to purchase it rather than the similar product/service of a competitor. It is generally accepted that the distinctive competencies are cost/price, quality, flexibility, and service/time. Various experts include other competencies, such as location, but these can usually be categorized within one of the generally accepted four. Some experts also feel that innovation is quickly becoming a fifth distinctive competency, if it hasn't already. It should be noted that a firm's position on the product-process matrix is a controlling factor for the manufacturing mission and the firm's competitive priority or priorities.

Distinctive Competencies

Details relative to each distinctive competency are provided, along with the implications of each and some examples.

PRICE/COST.

A firm competing on a price/cost basis is able to provide consumers with an in-demand product at a price that is competitively lower than that offered by firms producing the same or similar good/service. In order to compete on a price basis, the firm must be able to produce the product at a lesser cost or be willing to accept a smaller profit margin. Firms with this competency are generally in a position to mass produce the product or service, thereby giving the firm economies of scale that drive the production cost per unit down considerably. Commodity items are mass-produced at such volume that they utilize a continuous process, thus deriving tremendous economies of scale and very low prices. Consumers purchasing commodity-type products are usually not greatly aware of brand difference, and will buy strictly on the basis of price; e.g., as long as it is a major brand of gasoline and location is not a factor, consumers will opt for the lowest price. Wal-Mart is able to offer low prices by accepting a lower profit margin per unit sold. Their tremendous volume more than makes up for the lower profit margin.

QUALITY.

David Garvin lists eight dimensions of quality as follows:

- *Performance.* Performance refers to a product's primary operating characteristics. For an automobile this could mean fast acceleration, easy handling, a smooth ride or good gas mileage. For a television it could mean bright color, clarity, sound quality or number of channels it can receive. For a service this could merely mean attention to details or prompt service.
- *Conformance.* Conformance is the degree to which a product's design and operating characteristics meet predetermined standards. When a manufacturer utilizing coils of steel receives a shipment from the mill, it checks the width of the coil, the gauge (thickness) of the steel, the weight of the coil, and puts a sample on a Rockwell hardness tester to check to ensure that the specified hardness has been provided. Receiving inspection will also check to see if specified characteristics are met (e.g., hot-rolled, pickled, and oiled). Services may have conformance requirements when it comes to repair, processing, accuracy, timeliness, and errors.
- *Features.* Features are the bells and whistles of a product or service. In other words, characteristics that supplement the basic function of the product or service. Desirable, but

not absolutely necessary, features on a VCR include four heads, slow-motion capability, stereo or surround sound, split screens or inset screens, and 365-day programming ability. Service examples include free drinks on an airline flight or free delivery of flowers.

- *Durability.* Durability is defined as mean time until replacement. In other words, how long does the product last before it is worn out or has to be replaced because repair is impossible? For some items, such as light bulbs, repair is impossible and replacement is the only available option. Durability may be had by use of longer life materials or improved technology processes in manufacturing. One would expect home appliances such as refrigerators, washer and dryers, and vacuum cleaners to last for many years. One would also hope that a product that represents a significant investment, such as an automobile, would have durability as a primary characteristic of quality.
- *Reliability.* Reliability refers to a product's mean time until failure or between failures. In other words, the time until a product breaks down and has to be repaired, but not replaced. This is an important feature for products that have expensive downtime and maintenance. Businesses depend on this characteristic for items such as delivery trucks and vans, farm equipment and copy machines since their failure could conceivably shut down the business altogether.
- *Serviceability.* Serviceability is defined by speed, courtesy, competence and ease of repair. This is can be an extremely important characteristic as witnessed by the proliferation of toll-free hot lines for customer service. A number of years ago, a major television manufacturer advertised that its product had its "works in a box." This meant that the television set was assembled out of modular units. Whenever there were problems with the set, a repairman making a house call simply had to replace the problem module, making the product easily and quickly serviceable.
- *Aesthetics.* A product's looks, feel, smell, sound, or taste are its aesthetic qualities. Since these characteristics are strictly subjective and captive to preference, it is virtually impossible to please everyone on this dimension.
- *Perceived Quality.* Perceived quality is usually inferred from various tangible and intangible aspects of the product. Many consumers assume products made in Japan are inherently of high quality due to the reputation of Japanese manufacturers, whereas 50 years ago, the perception was the complete opposite. Other characteristics such as high price or pleasing aesthetics may imply quality.

Firms competing on this basis offer products or services that are superior to the competition on one or more of the eight dimensions. Obviously, it would be undesirable if not impossible for firms to compete on all eight dimensions of quality at once. This would be prohibitively expensive, and there are some limitations imposed by trade-offs that must be made due to the nature of the product. For example, a firm may sacrifice reliability in order to achieve maximum speed.

SERVICE.

Service can be defined in a number of ways. Superior service can be characterized by the term customer service or it could mean rapid delivery, on-time delivery, or convenient location.

FLEXIBILITY.

Firms may compete on their ability to provide either flexibility of the product or volume. Firms that can easily accept engineering changes (changes in the product) offer a strategic advantage to their customers. This can also apply to services. A number of years ago, a well-known fast food restaurant advertised "hold the pickles, hold the lettuce, special orders don't upset us," which meant that ordering a non-standardized version of the product would not slow down the delivery process. Also, some firms are able to absorb wide fluctuations in volume allowing customers with erratic demand the luxury of not holding excessive inventories in anticipation of change in demand.

TRADEOFFS.

Firms usually focus on one distinctive competency (rarely more than two). For some competencies there are tradeoffs involved. An automobile manufacturer producing a product that is considered to be of high quality (leather seats, real wood trim, and an outstanding service package) will not be able to compete on a cost/price basis as the cost of manufacture prohibits it. An automotive parts house would like to keep their customers happy by offering the lowest prices possible. However, if the automotive parts house also wants to be able to fill almost every single order from walk-in customers, it must maintain an extensive inventory. The expense of this inventory could preclude the parts house from offering prices competitive with other similar firms not choosing to provide this level of service. Therefore, one parts house is competing on the basis of service (but not cost/price) while the other is competing on the basis of cost/price (but not service). The customer may have to wait a few days to get the desired part; if the customer cannot wait, he or she can pay more and purchase the part immediately from the competitor.

ORDER WINNERS/QUALIFIERS

Operations strategist and author Terry Hill introduced the terms qualifier and order winner (1989). A qualifier is a competitive characteristic a firm or product must be able to exhibit to be a viable

competitor in the marketplace. An order winner is a competitive characteristic of a product or service that causes a customer to choose this firm's product or service rather than that of a competitor (distinctive competence). For example, say a consumer in the market for a new automobile has a predetermined level of quality that the automobile must possess before being considered for purchase. The consumer has narrowed his or her choice down to five models of automobile that all meet this minimum quality requirement. From this point the consumer, with all else being equal, will probably purchase the automobile that he or she can get for the least cost. Therefore, quality is the qualifier (must be present to be considered) and cost/price is the order winner (basis for the final choice).

The Need for an Operations Strategy

In too many instances, a firm's operations function is not geared to the business's corporate objectives. While the system itself may be good, it is not designed to meet the firm's needs. Rather, operations is seen as a neutral force, concerned solely with efficiency, and has little place within the corporate consciousness. Steven C. Wheelwright and Robert H. Hayes described four generic roles that manufacturing can play within a company, from a strategic perspective. While they specifically discuss the manufacturing function, the term operations can be substituted with no loss in relevance. These generic roles are labeled stages 1 to 4, as explained below.

Stage 1 firms are said to be internally neutral, meaning that the operations function is regarded as being incapable of influencing competitive success. Management, thereby, seeks only to minimize any negative impact that operations may have on the firm. One might say that operations maintain a reactive mode. When strategic issues involving operations arise, the firm usually calls in outside experts.

Stage 2 firms are said to be externally neutral, meaning they seek parity with competitors (neutrality) by following standard industry practices. Capital investments in new equipment and facilities are seen as the most effective means of gaining competitive advantage.

Stage 3 firms are labeled internally supportive, that is, operations' contribution to the firm is dictated by the overall business strategy but operations has no input into the overall strategy. Stage 3 firms do, however, formulate and pursue a formal operations strategy.

Stage 4 firms are at the most progressive stage of operations development. These firms are said to be externally supportive. Stage 4 firms expect operations to make an important contribution to the competitive success of the organization. An operation is actually involved in major marketing and

engineering decisions. They give sufficient credibility and influence to operations so that its full potential is realized. Firms within Stage 4 are known for their overall manufacturing capability.

Since the bulk of many, if not all, firms have the bulk of their labor force and assets tied to the operations function, it makes sense for most firms to strive for a position in Stage 3 or Stage 4. Firms can, of course, evolve from one stage to the next with few, if any, skipping a stage. In fact, most outstanding firms are in Stage 3, as Stage 4 is extremely difficult to reach.

The need for an operations strategy that reflects and supports the corporate strategy is not only crucial for the success of the corporate strategy but also because many decisions are structural in nature. In other words, the results are not easily changed. The firm could be locked into a number of operations decisions, which could take years to change if the need arose. These could range from process investment decisions to human resource management practices. Too often, marketing-led strategies leave operations to resolve the resulting issues from their unilateral view of what is best for the business as a whole. If corporate management cannot fully appreciate the issues and consequences of relegating operations to a tactical status it could find itself needing to make structural changes that are costly, time consuming, and much too late to make the competitive impact necessary to compete effectively.

Firms that fail to fully exploit the strategic power of operations will be hampered in their competitive abilities and vulnerable to attack from those competitors who do exploit their operations strategy. To do this effectively, operations must be involved throughout the whole of the corporate strategy. Corporate executives have tended to assume that strategy has only to do with marketing initiatives. They erroneously make the assumption that operation's role is strictly to respond to marketing changes rather than make inputs into them. Secondly, corporate executives assume that operations have the flexibility to respond positively to changing demands. These assumptions place unrealistic demands upon the operations function.

A recent article by Michael A. Lewis in the *International Journal of Operations and Production Management* warns firms a practical operations strategy is iterative and will require market compromise. While corporate management perceives corporate improvement as coming through broad decisions concerning new markets, takeovers, and so on, it overlooks the idea that building blocks of corporate success can be found in the creative and effective use of operations strategy to support the marketing requirement within a well-conceived corporate strategy.

Operations management's attention must increasingly be toward strategy. The balance and direction of its activity should reflect its impact on the firm's performance toward achieving its goals through its strategy, and on the performance of operations itself, recognizing that both need to be done well.

Linda Nielsen-Englyst recommends a four-phase process for formulating and updating operations strategy: learning, reviewing, aligning, and redirecting. Phase one is a learning stage where alternatives to the intended strategy are evaluated in practice. Phase two involves reviewing alternatives over time, allowing ideas to grow and mature. Phase three, the alignment stage, is an analytical process where the firm attempts to identify and document financial rationale for changing the intended strategy. Finally, in the redirecting phase, the firm tests its ideas in practice through local initiatives.

Operational Efficiency

Operational efficiency is the capability of an enterprise to deliver products or services to its customers in the most cost-effective manner possible while still ensuring the high quality of its products, service and support.

Operational efficiency is often achieved by streamlining a company's core processes in order to more effectively respond to continually changing market forces in a cost-effective manner.

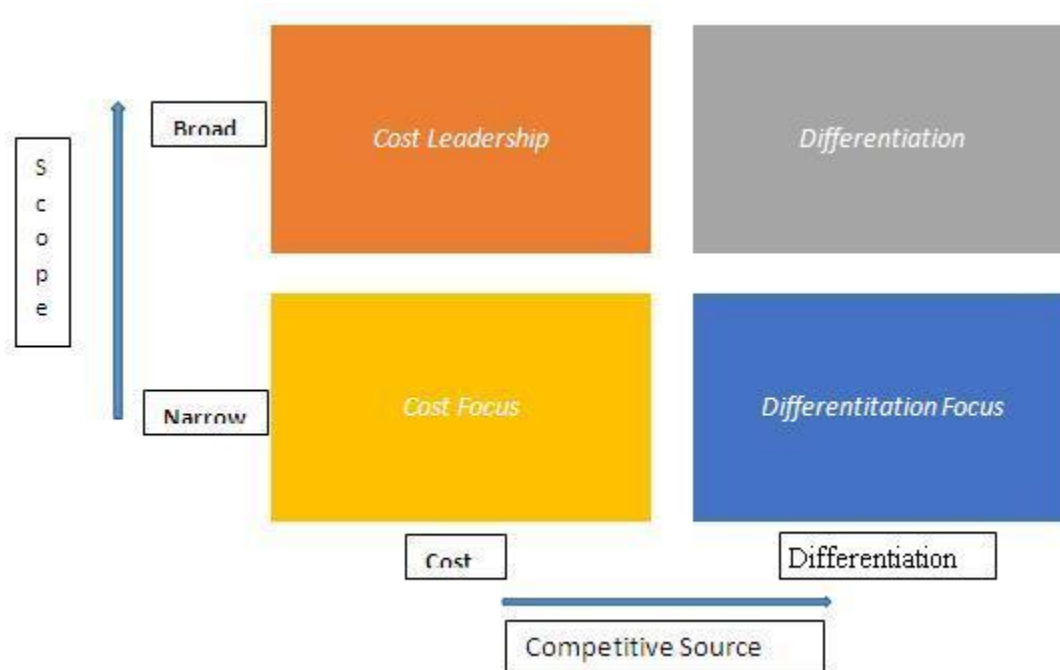
In order to attain operational efficiency a company needs to minimize redundancy and waste while leveraging the resources that contribute most to its success and utilizing the best of its workforce, technology and business processes. The reduced internal costs that result from operational efficiency enable a company to achieve higher profit margins or be more successful in highly competitive markets.

Competitive Strategy

Competitive Strategy is defined as the long term plan of a particular company in order to gain competitive advantage over its competitors in the industry. It is aimed at creating defensive position in an industry and generating a superior ROI (Return on Investment). Such type of strategies play a very important role when industry is very competitive and consumers are provided with almost similar products. One can take example of mobile phone market.

Before devising a competitive strategy, one needs to evaluate all strengths, weaknesses, opportunities, threats in the industry and then go ahead which would give one a competitive advantage.

According to Michael Porter, competitive strategy is devised into 4 types:



1. Cost Leadership

Here, the objective of the firm is to become the lowest cost producer in the industry and is achieved by producing in large scale which enables the firm to attain economies of scale. High capacity utilization, good bargaining power, high technology implementation are some of factors necessary to achieve cost leadership. E.g. Micromax mobile phones

2. Differentiation leadership

Under this strategy, firm maintains unique features of its products in the market thus creating a differentiating factor. With this differentiation leadership, firms target to achieve market leadership. And firms charge a premium price for the products (due to high value added features) Superior brand and quality, major distribution channels, consistent promotional support etc. are the attributes of such products. E.g. BMW, Apple

3. Cost focus

Under this strategy, firm concentrates on specific market segments and keeps its products low priced in those segments. Such strategy helps firm to satisfy sufficient consumers and gain popularity. E.g. Sonata watches concentrates on lower segment customers by providing

4. Differentiation focus

Under this strategy, firm aims to differentiate itself from one or two competitors, again in specific segments only. This type of differentiation is made to meet demands of border customers who refrain from purchasing competitors' products only due to missing of small features. It is a clear

niche marketing strategy. E.g. Titan watches concentrates on premium segment which includes jewels in its watches. Without following anyone of above mentioned competitive strategies, it becomes very difficult for firms to sustain in competitive industry.