
UNIT 1 PRODUCTION AND OPERATIONS MANAGEMENT: AN OVERVIEW

Objectives

Perusal of this unit will impart to the students an understanding of the.

- scope and significance of the specialist function of operations management
- impact of encompassing management of services operations which are expanding in terms of potential employment
- paradigm shift as operations management became more focussed as the vital link in delighting and surprising the customer
- appreciation that operations management capabilities can be significantly enhanced by building long-term relationship with the suppliers
- role of manufacturing and service operations as a responsible corporate citizen in combating pollution
- social issues involved and the need to reorient social values in favour of the profession of operations management if it has to provide the cutting edge in competitive strategies

Structure

- 1.1 Scope and Significance
- 1.2 Systemic View of Operations Management
- 1.3 Factors of Production
- 1.4 Productive Use of Resources
- 1.5 Environmental Concerns of Operations
- 1.6 Social Concerns of Operations
- 1.7 Multidisciplinary Nature of Operations
- 1.8 Whither Operations Management in India
- 1.9 Summary
- 1.10 Self-Assessment Exercises
- 1.11 Further Readings

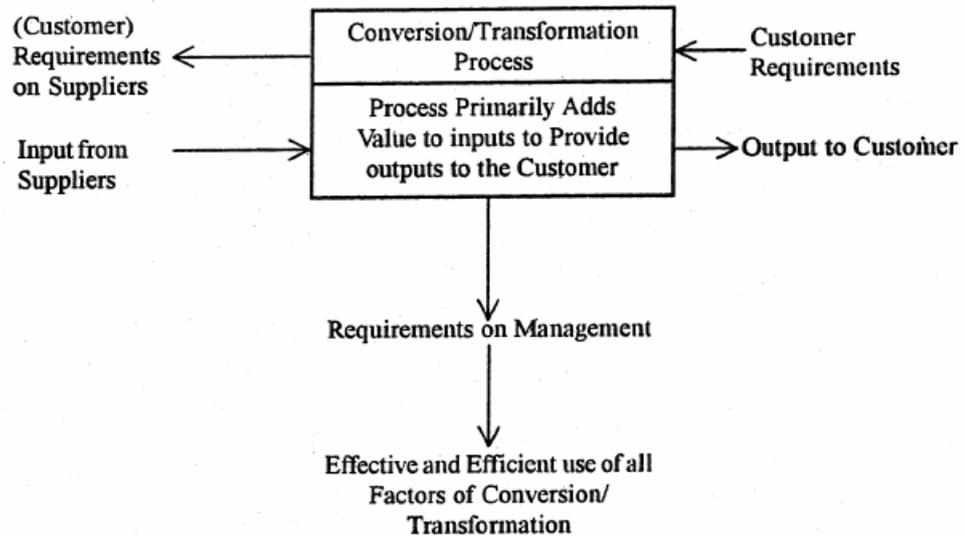
1.1 SCOPE AND SIGNIFICANCE

The study of this functional area, originally known as production or manufacturing management, was changed when it was re-christened as operations management arising from the compelling need to encompass the rapidly expanding service sector. If the entire economy, of the nation is divided into agriculture and agriculture based industry, manufacturing of tangible goods and service industry, service sector is growing at much faster rate. In USA it has already emerged as the largest employer. During the recent recession in USA (1989-1993), the employment level in the manufacturing industries shrank. However, number of persons working in service sector increased, although at a lower rate. In India also, entrepreneurs with new, innovative and untried ideas, are entering the service sector to cater to the unmet needs of the population. It is therefore, more appropriate to describe it as "Management of Manufacturing and, Service Operations" - distinct from other functional areas of marketing, finance, human resources, information & systems, public relations, corporate communications, legal etc., but more basic because a lot of learning has originated from it and transcended into other functional areas. Some of the functional sub areas have achieved such eminence that they are being explored as full-fledged subjects of study, viz. quality management, technology management, project management, purchasing and materials management, productivity management and ergonomics, safety, health and environment management.



1.2 SYSTEMIC VIEW OF OPERATIONS

There has been a sea-change in the scenario of operations management. Manufacturing facilities of producing tangible goods were far removed from the customer; this impacted adversely on the customer - orientation of production personnel. Thanks to the primacy given to the customer focus, operations managers had to re-orient their thinking and learning the true meaning of customizing their work processes. Conversion of raw materials into finished products and delivering services to transform an unsatisfied customer into a satisfied one. has been identified as the vital link in the primary value chain of an enterprise. The new focus is illustrated below:



In a generic way, conversion process adds value to raw materials by changing its shape, size or weight and transformation process entails changes in form, location or time.

1.3 FACTORS OF PRODUCTION

In economics theory we are told about the following four factors of production viz.

- Land
- Labour
- Capital
- Enterprise or Entrepreneurship.

With the increasing fluidity of money, land has become interchangeable with money. Industrial managers are also engaged in effective and efficient utilization of a huge variety of resources as below:

- 1) Men
- 2) Money
- 3) Machines
- 4) Materials
- 5) Methods
- 6) Management
- 7) Measurement
- 8) Message (information and communication)
- 9) Motive power (energy).



Excepting perhaps men (workmen) and money, all other resources are knowledge-based and technology-oriented. In the knowledge society we have already entered (Peter Drucker), we are Witnessing increasing ingress of knowledge inputs in every work process. Already, the whole world is busy unraveling the possibilities of integrating information technology with every work process of homo sapien society.

1.4 PRODUCTIVE USE OF RESOURCES

Operations personnel usually have a large volume and variety of resources at their command - they should endeavour to make effective and efficient use of these resources to achieve the target outputs. In general

$$\text{Input} = \text{Output} + \text{Waste}$$

Dividing both sides by input. we obtain

$$\frac{\text{Input}}{\text{Input}} = \frac{\text{Output}}{\text{Input}} + \frac{\text{Waste}}{\text{Input}}$$

$$= \text{Productivity} + \text{Wastivity}$$

There are two approaches for enhancing utilization of resources viz.

a) **Increasing productivity**

Productivity like efficiency is the ratio of output to input

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

This ratio can be increased/improved in the following ways:

- i) Increasing output while keeping inputs constant
- ii) Decreasing inputs while keeping output constant
- iii) Increasing output in greater proportion than the increase in input.

b) **Decreasing Wastivity**

Reduction of waste or scrap is another way of enhancing productivity. If we work out the material balance of a work process, we become aware of this intimate relationship. One surest and best way to reduce wastivity is to minimize generation of waste at the source itself. This is a whole new and latest concept in combating waste and pollution, i.e., going in for "cleaner technologies". The emphasis is shifting to tackling the problems at the source of generation of pollution rather than doing fire fighting, control and management subsequently. For example, emissions from automobiles are adding to the atmospheric pollution at such alarming rate that most large cities are becoming "asthemic". Although there is in urgent need in cities like Delli of combating and controlling air pollution, the need of a long-term policy of switching over to automobiles with cleaner technologies, where emissions are way below the-permissible norms cannot be fault. It must appear to be the only sustainable solution to this menacing problem on a long term basis.

1.5 ENVIRONMENTAL CONCERNS OF OPERATIONS

Although there is much to commend for operations management which has served rather %yell as the main vehicle of material progress of mankind, we have, in the process administered a severe blow to the environments and ecology. In our pursuit of insatiable thrust of "getting and begetting", we have damaged our environment to such an extent



that we are now facing the grim prospects of ozone layer puncture, green house effect of carbon-di-oxide emissions leading to global warming and suffocating level of atmospheric pollution in over populated cities like Delhi and Calcutta. In response to societal concerns for the alarming rise in pollution, most countries in the world have formulated statutes and legislated on the following types of pollutants:

- 1) Solid Waste
- 2) Liquid Waste
- 3) Atmospheric Pollution
- 4) Noise Pollution

Government of India has also enacted the following laws:

- The Hazard Wastes (Management & Handling) Rules, 1989 framed under the Environment Protection Act 1986 for solid wastes
- The Water (Prevention and Control) Act of 1974, amended in 1978, 1988 etc. for liquid wastes
- The Air (Prevention and Control of Pollution) Act of 1981 relating to air pollution

There is no law at the national level on noise pollution. Local civic and police authorities are empowered to ban use of loudspeakers but the regularity with which these bans are flouted by religious organizations in particular and for so called religious festivals in general is very annoying.

Also, there is no legislation on population explosion and alleviation of poverty nor our national planners have succeeded in combating this problem. Perhaps, the only salvation is to seek and secure a technological solution to the baffling problems of population explosion and poverty eradication, the two biggest polluters of the world.

1.6 SOCIAL CONCERNS OF OPERATIONS

Operations management can rightly pride itself for being in the vanguard of material progress in the entire world. New technologies have contributed to a large number of products and services being made available at affordable prices. It has made life more comfortable and enjoyable, which has been the very purpose of industrialization as an engine to development.

Industrialization has created the need and awareness of knowledge and information and has motivated a large proportion of population to become literate. In a country like India, it has contributed significantly to developing national integration. A large number of cities started as nodal points for setting up industry and have grown rapidly to become large cities, accelerating urbanization and reducing pressure on agriculture and agriculture related industries.

1.7 OPERATIONS MANAGEMENT IS MULTIDISCIPLINARY

No job, thanks to increasing complexity of business, is pure, unalloyed, single-functional; all jobs are multi-disciplinary. A young person starting his career should not be upset that the job that he/she is assigned is not pure or single functional - in fact, richness of the job is measured by the multidisciplinary tapestry of the functions involved.

Today it is commonplace to hear, "Business is people; dealing with people is marketing". In another context we say, "people management is not one department in the company, it is the function of every employee of the company". Another experienced person would suggest that, "finance is the common denominator for all activities performed in the company." or "What is the organization without communication; communication is the life blood of organizations."

Similarly, operations management is no exception; on the contrary, it encompasses a vast and diverse array of bodies of knowledge as below:



- 1) Product design, development and management
- 2) Process design, development and management
- 3) Methods and manufacturing engineering
- 4) Material handling systems and layout studies
- 5) Capacity and manning studies
- 6) Site selection and facilities planning
- 7) Project management - establishing or expanding a facility
- 8) Purchasing, warehousing and materials management
- 9) Operations planning, scheduling and control
- 10) Material and resource planning for production and manufacturing
- 11) Maintenance and upkeep of machines
- 12) Productivity management and designing effective man, machine and environment systems.
- 13) Quality control and management
- 14) Safety, health and environment management

Besides a good operations person must have good grounding in

- 15) Finance and cost-accounting
- 10) Human resource and people management
- 16) Legal provisions for running an operations facility etc.

There is, therefore, an urgent need to inject persons with multi-disciplinary knowledge in the functional area of operations management.

1.8 WHITHER OPERATIONS MANAGER IN INDIA

Whereas there is an urgent need to transform operations management by recruiting and positioning more and more of multi-disciplinary freshers, the scene is not encouraging. There is an overabundance of technical specialties or graduates of the University of experience. As a result, their mindsets and culture is deeply embedded with the conventional wisdom - a deep seated paradigm which helps them to reinforce, "this is the way things are done here".

Most operations facilities are located in small town, away from the residential area. Even in large cities, industrial area. are usually scattered around the fringes. Working hours are longer (48 hours a work as against the general norm of 40 hours approximately in commercial offices), commuting time and distances are longer and there is more regimentation

There is a higher premium on conformance, congruence and convergence. As a result, although there is an urgent need to change in favour of qualified engineers with MBA degree, the profession does not seem to attract them. Armed with a postgraduate qualification. in management, engineers are joining marketing, finance, personnel, information, administrative services etc in large number. It may not be wrong to say that the top layer of engineering graduates are seeking pastures in functional areas other than operations management or even migrating to other countries!

Until and unless the society is able to attract and retain their best human assets in operations management, creativity suffers.

We have two models available in the current global scenario - Japanese who gave a very high primacy to operations management and have innovated numerous management systems to support and sustain excellence in all other functional areas and we have the USA Model which always reinforced marketing oriented approach to business. A case can be easily made in favour of a synthesis for India as this would ensure the best of both worlds. However, in no case should we copy and adopt blindly, have to derive and develop our own processes of management based on Indian, ethos and values.



1.9 SUMMARY

The so called production or manufacturing management has been renamed as operations management. The system study of operations management encompasses the input-process output, where the conversion process adds value to raw materials by changing its shape, size or weight. Industrial managers are engaged in effective and efficient utilisation of large variety of resources like men, machine, material, methods, management and so on. Operations management includes a vast and diverse array of bodies of knowledge thereby signifying that it is a multidisciplinary by nature.

1.10 SELF-ASSESSMENT EXERCISES

- 1) Why have we changed the name from production to operations management?
- 2) Take any service organization and draw up a schematic of its overall process of inputs and outputs?
- 3) Take a typical agriculture, poultry or dairy farm, draw up their schematics of the overall process. What are the common features?
- 4) "We have entered the age of technology: henceforth everything will be knowledge based." Discuss the above in the context of increasing use of technology - based resources for achieving tasks.
- 5) Explain the complementary role of productivity and wastivity in effective utilization of resources.
- 6) Can 'space' be construed as a resource? If so how would you measure its productivity?
- 7) What is proactive management of environmental pollution?
- 8) What are social issues involved in operations management?
- 9) What are the beneficial effects of industrial operations?
- 10) Justify that operations management is a multi-disciplinary function

1.11 FURTHER READINGS

- 1) T. Hill, Production/Operations Management, Prentice Hall, London.
- 2) R.H. Hayes and S.C. Wheelwright, Restoring our Competitive Edge Through Manufacturing, John Wiley.
- 3) W. Skinner, Manufacturing: The Formidable Competitive Weapon, John Wiley.
- 4) T. Hill, Manufacturing Strategy, Macmillan.