Subject: Apparel Production Management

Unit 1: Introduction to production processes

Quadrant 1 – e-Text

Learning Objectives

The learning objectives of this unit are:

- State the apparel market analysis.
- Explain about basic production processes and strategies.
- Describe the Apparel Production Planning and Control process.

1.1 Introduction

India is the world's second largest producer of textiles and garments. The domestic textile and apparel industry in India is estimated to reach US$ 100 billion by 2017 and US$ 141 billion by 2021 from US$ 67 billion in 2014. The Exports have been a core feature of India's textile and apparel sector and its export is expected to increase to US$ 82 billion by 2021 from US$ 40 billion in 2014.

India's share of the world's apparel exports stands at 4.5%. It is estimated that due to the increasing shift of apparel and textile production to Asian nations and the deteriorating export-competitiveness of China, this figure will grow to 8% by 2020, with a total exports value of $82 billion. This growth, from 4.5 to 8% of world trade, will open up huge potential for Indian players.

1.2 Indian and worldwide apparel market

In 2007, the worldwide apparel market was worth 345 billion US $ and during the last decade the market grew at an average of 8% per annum.

India has the potential to become a rapidly growing market for better-quality apparel, particularly brand-name fashion goods. The country’s sizable middle class of an estimated 200 million, which is expected to double in the next 10 years, includes an estimated 40 million people who prefer brand-name fashions. India has the potential to benefit significantly from

ongoing global trade liberalization in apparel, particularly now that the GOI has deregulated the apparel sector.

A recent study of the Indian apparel and textile industry concluded that India has the potential to double its current world market share in apparel during the next 5 years, provided that the apparel sector invests about $16.6 billion in new production technology.

In the inaugural session Peush Narang, principal consultant, at Technopak Advisors, said the global share of textile industry was 4.5% in 2011 and is expected to be 6% in 2016 and 8% in 2021. Globally, apparel industry is expected to grow at a CAGR of 6%t.

He said EU and USA has still not recovered from the 2008 crisis and the trend is likely to continue. China and India are emerging hubs in the apparel industry.

Rising government focus and favourable policies to support the industry has led to growth in the industry. In the 12thFive Year Plan, the Government plans to provide a budgetary support to textiles of US$ 4.25 billion against US$ 4.18 billion in the 11th Five Year Plan. Free trade with ASEAN countries and the proposed agreement with European Union will help boost exports.

1.3 Challenges facing the apparel industry

The apparel industry faces many challenges. This includes:

1. Rising cost, raw material cost and increase in volatility in raw material prices.

2. Labor unrest

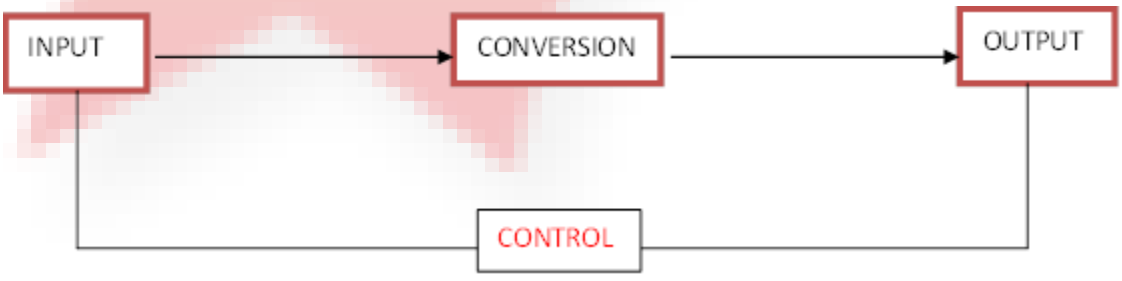
3. Poor work environment, and

4. Supply chain problem (lead time).

These are some of the challenges which can be solved by sincere efforts...".

1.4 Introduction to Production System

Production system is a system whose function is to convert a set of inputs into a set of desired outputs. Production system as depicted in this chart.



Land, Building *goods*
Machines, labour, capital *services*
Management, raw material
Energy, others

Examples of Input for a company includes land, buildings, machines, labour, capital management and raw material.

Examples of Output are goods and services.

Production system is the framework within which the production activities of an enterprise take place. Production is the process of conversion process through which inputs are converted into outputs. An appropriate designing of production system ensures the coordination of various production activities. There is no single pattern of production system which is universally applicable to all types of production system. It varies from one enterprise to another.

Production Management

Production management involves the managerial decisions regarding design of the product and design of the production system i.e. determination of production processes and production planning and control.

Production Control

Production control function is to produce to products with minimum total cost in required planned delivery time frame. The efficiency of the production control performance is equal to the precision of time and cost anticipation. Greater the deviation from the scheduled time and cost figure, the poorer the production control performance.

Manufacturing Processes

The manufacturing process is a sequence of operations and processes designed to create a specific product.

Four Basic Types of Production Processes

The four basic types of production process are:

Intermittent Production System, Mass production, Mass customization and Continuous Production processes.

Intermittent Production System

Production is performed on a start-and-stop basis, such as for the manufacture of made-to-order products. Under this system the goods may be produced partly for inventory/stock and partly for customer's orders. E.g. components are made for inventory but they are combined differently for different customers. Automobile plants, printing presses, electrical goods plant are examples of this type of manufacturing. This system can also be used for customized products.

Mass Production

Mass Production is a way to make many products faster and cheaper. Mass Production fueled the Industrial Revolution, made many products available cheaply, provided jobs for unskilled laborers and changed from Agrarian to Industrial Society.

Mass Production uses many things to create products, such as System Model, Standardized Parts, Interchangeable Parts, Assembly Line, Unskilled Labour, Transportation and Energy.

Mass Customization

Designing, producing, and delivering customized products to customers for at or near the cost and convenience of mass-produced items. Mass customization combines high production volume with high product variety.

The Elements of mass customization are Modular product design, Modular process design, Agile supply networks. Advanced technologies are required to move toward mass customisation.

Continuous Production Processes

A production process, such as those used by chemical plants or refineries, that runs for very long periods without the start-and-stop behavior associated with intermittent production.

Key features of this process are Enormous capital investments, Highly automated facilities, Special-purpose equipment, High volumes of production, Little or no variation in the type of outputs, High product quality.

It is also known as mass flow production or assembly line production. It is used in companies like for example, petrochemical refineries, soft drink, distilleries, fiber production, paper manufacturing and power plants etc.

Choice of Manufacturing Process

This depends on these factors:

Volume/variety, Capacity of the plant, Lead time/throughput time, Flexibility and Efficiency, WIP (work in process) and skill availability.

a) Volume/variety: When the volume is low and variety is high, intermittent (modular) process is most suitable and with increase in volume and reduction in variety continuous (assembly line) process become suitable.

b) Capacity of the plant: Projected sales volume during forecasting is the key factor to make a choice of manufacturing process. In case of assembly line process, fixed costs are substantially higher than variable costs. The reverse is true for modular process.

c) Lead time/throughput time: - lead-time and level of competition certainly influence the choice of production process.

d) Flexibility and Efficiency: - The manufacturing process needs to be flexible enough to adapt to variety of products and volume of production at lower costs.

e) WIP (work in process)

f) Skill availability.

Hence, it is very important for an entrepreneur to consider all these factors, before taking a decision regarding the type of manufacturing process to be adopted.

1.5 Production Planning and Control

Production control's function is to produce products with minimum total cost in the required planned delivery time frame. The production plan should anticipate the progress of the production of any and every individual product from the receipt of raw material to the shipment of the order. Production plan should also permit one to anticipate the itemized and total cost of production and delivering the product.

Production control is composed of sequence of four activities: Analysing, Forecasting, Planning and Controlling.

Analysing:

It is the process of determining

1. Quality specifications of the product. It provides specifications for elements of production, like Raw materials, Equipment and tools, Production personnel; that will yield the durability, utility and emotional appeal (style factors) required for the garment.

2. Quantitative production capacity of the each operation, job or process is analysed. It determines the anticipated load of production per unit time.

Forecasting:

It is the process of estimating the future sales volume, rate of sales, and the rate of delivery.

Planning (Organising and Scheduling):

It is the activity of organising the sequence of communications and material processing. Scheduling is the second half of the planning activity; it adds the 'when' to organising ' what ' and 'where'.

Controlling:

It is the activity with which the production manager inspects and corrects the execution of the production plan. It is the action that must be taken to change the production plan whenever production is behind the planned schedule because of improper planning, unforeseen emergencies, or unpredicted occurrences. The Factors responsible for control are: Varied and repetitive character of operations, Nature of manufacturing and the Magnitude of operation. As customer bases grow, there are more and more style variations within the product. Style variation also brings about situations where line should be loaded in hours rather than units. Ever changing demands makes it more difficult for lines to maintain their balance or meet schedules. It becomes apparent that a closer check on production becomes necessary.

Today, production control should be responsible for the Scheduling, loading, controlling and reporting of balanced conditions, lines and the attainment of scheduled completion dates.

Factors Determining Control Procedures

1. Varied and repetitive character of operations

2. Nature of manufacturing

3. Magnitude of operation

Varied and repetitive character of operations: In general, variety of operations complicates the problem of planning and control, whereas repetitive operations, since they reduce the variety, tend to simplify the problem.

There are all sorts of variant between two extremes. Some of the principal variants are:

a. Manufacturing to order : which may or may not be repeated at regular interval

b. Manufacturing to stock: where products are made up of the parts but processes are not optional

c. Number of ultimate part in the product, number of different operations in each part and the extent to which processes are dependent.

d. Variation in the capacity of machine for different classes of work.

e. Degree of subassembly

f. lead time

Nature of Manufacturing

The degree to which control is required depends on type of manufacturing:

1. Custom manufacturing
2. Stock manufacturing

Magnitude of operation: The scale of operation determines the control required.

In small scale enterprise, control is more informal because it is more personal and direct.

Production Strategies

1. Make to order – products and services are made to customer's specifications after an order has been received
2. Make to stock - products and services are made in anticipation to demand
3. Assemble to order - products and services add option according to customer specifications

1.6 Conclusion

To summarize, in this unit you have reviewed apparel market analysis and reviewed basic production processes and strategies and apparel production planning and control.