

Production process

The production process is concerned with transforming a range of inputs into those outputs that are required by the market.

This involves two main sets of resources - the transforming resources, and the transformed resources. The transforming resources include the buildings, machinery, computers, and people that carry out the transforming processes. The transformed resources are the raw materials and components that are transformed into end products.

Any production process involves a series of links in a production chain. At each stage value is added in the course of production. Adding value involves making a product more desirable to a consumer so that they will pay more for it. Adding value therefore is not just about manufacturing, but relates to all processes e.g. advertising, promotion, distribution, etc that make the final product more desirable.

It is very important for businesses to identify the processes that add value, so that they can enhance these processes to the ongoing benefit of the business.

There are three main types of process: job, batch and flow production.

Job production

Job or 'make complete' production is the creation of single items by either one operative or a team of operative's e.g. the Humber Bridge or a frigate for the navy.

It is possible for a number of identical units to be produced in parallel under job production, e.g. several frigates of a similar type. Smaller projects can also be seen as a form of job production, e.g. hand knitting a sweater, writing a book, rewiring a house, etc.

Job production is unique in the fact that the project is considered to be a single operation, which requires the complete attention of the operative before he or she passes on to the next job. A good example of job production is the work carried out by Portakabin in creating modular buildings such as offices, which it designs, assembles and maintains for clients. Examples from the service industries include cutting hair, and processing a customers' order in a store like Argos.

The benefits of job production are:

1. The job is a unique product, which exactly matches the requirements of the customer, often from as early as the design stage. It will therefore tend to be specific to a customer's order and not in anticipation of a sale. For example, someone doing a customised spray paint job on a motorcycle will first discuss with a customer the sort of design he would like. A detailed sketch would then be produced on a piece of paper. Once the sketch has been approved the back of the sketch will be chalked over and traced on to the relevant piece of the motorbike. The background work is then sprayed on with an airbrush before the fine detail is painted on. The finished work is then inspected by the customer who will pay for a unique product.
2. As the work is concentrated on a specific unit, supervision and inspection of work are relatively simple.
3. Specifications for the job can change during the course of production depending upon the customer's inspection to

meet his or her changing needs. For example, when a printing firm like Polestar is asked to produce a catalogue for a grocery chain it is relatively simple to change the prices of some of the goods listed in the catalogue.

4. Working on a single unit job, coping with a variety of tasks and being part of a small team working towards the same aim would provide employees with a greater level of satisfaction. For example, aircrews working for United Airways would treat each flight as a specific job, with passengers requiring individual attention to their specific needs - e.g. for vegetarian dishes, wheelchair access to the flight, etc.

Batch production

The term batch refers to a specific group of components, which go through a production process together. As one batch finishes, the next one starts.

For example on Monday, Machine A produces a type 1 engine part, on Tuesday it produces a type 2 engine part, on Wednesday a type 3 and so on. All engine parts will then go forward to the final assembly of different categories of engine parts.

Batches are continually processed through each machine before moving on to the next operation. This method is sometimes referred to as 'intermittent' production as different job types are held as work-in-progress between the various stages of production.

The benefits of batch production are:

1. It is particularly suitable for a wide range of almost similar goods, which can use the same machinery on different settings. For example batches of letters can be sent out to customers of an insurance company.
2. It economises upon the range of machinery needed and reduces the need for a flexible workforce.
3. Units can respond quickly to customer orders by moving buffer stocks of work-in-progress or partly completed products through the final production stages.
4. It makes possible economies of scale in techniques of production, bulk purchasing and areas of organisation.
5. It makes costing easy and provides a better information service for management.

Flow production

Batch production is described as 'intermittent' production and is characterised by irregularity. If the rest period in batch production disappeared it would then become flow production. Flow production is therefore a continuous process of parts and sub-assemblies passing on from one stage to another until completion.

Units are worked upon in each operation and then passed straight on to the next work stage without waiting for the batch to be completed. To make sure that the production line can work smoothly each operation must be of standard lengths and there should be no movements or leakages from the line, i.e. hold-ups to work-in-progress.

For flow production to be successful there needs to be a continuity of demand. If demand varied, this could lead to a constant overstocking of finished goods.

Although with modern robotics it is possible to create variations in products being produced through continuous flow techniques, typically such products will be relatively standardised.

Achieving a smooth flow of production requires considerable pre-production planning to make sure that raw materials are purchased and delivered just-in-time, that sufficient labour is employed and that there is continuous attention to

quality throughout the production process.

The benefits of flow production are:

- * ease of using just-in-time techniques to eliminate waste and minimise costs
- * labour and other production costs will be reduced through detailed planning and the use of robotics and automation
- * deviations in the line can be quickly spotted through ongoing quality control techniques
- * as there is no rest between operations, work-in-progress levels can be kept low
- * the need for storage space is minimal
- * the physical handling of items is minimal
- * investment in raw materials and parts are quickly converted into sales
- * control is easy.