Quality Control and Quality Assurance.

What is Quality?

Quality is often defined simply as 'fitness for purpose'. After all if the product does the job it was designed to do, it must therefore have some level of quality. But there is more to quality than simple 'fitness for purpose'. A quality product or service can also be considered as offering good value for money or convenience or even practicality. Also quality has aspects which are internal to an organisation and also external to it. Internally quality may be measured against set targets or standards, externally against the performance of competition or competitors products.

Achieving Quality

For large manufacturing and service companies achieving quality is a complex task, which combines the work of several separate functions or departments within an organisation. These departments typically include:

- **Purchasing** - ensuring the right quantity and quality of raw materials or components are available for the production process
- **Operations** - structuring and managing the manufacturing process
- **Finance** - ensuring that capital is available for appropriate investment
- **Personnel** - ensuring that the factor of production labour is available in the right quantities with the right skills.
- **Marketing** - providing information on what is needed to be produced, i.e. What the customer demands, and in what quantities.

The role of the Purchasing Function or Department

The purchasing department will be given information on the quantity and quality of raw materials and components required by the manufacturing department. These requirements can be set by the use of business management planning processes such as MRPII

The basic method of ensuring quality of stocks is through the use of sampling. A sample of raw materials or components will be selected and these will be tested to ensure that they meet the performance standards required by the manufacturing department. For example road builders do not just dump any old stone in as a foundation for a new stretch of motorway. Each layer of stone, which lies below the tarmac, must reach standards of porosity, wear, strength etc. If a delivery of stone fails to reach these standards it will be rejected. With the same objective of ensuring quality, a camera manufacturer may test a camera motor drive by simulating 10,000 test photos. If it fails to meet the standards required, then the batch of camera motor drives may be refused.

A second more time consuming and possibly expensive method is to ensure quality, not at the sampling stage, but at the suppliers' manufacturing stage. This involves the firm buying components actually being involved in establishing the manufacturing process and quality controls at the place of manufacture,

that is at the suppliers. This method of quality assurance is obviously only open to the largest buyers, but it is happening more and more. And it can suit both maker and user of components. The maker is assured a market, the buyer is assured quality (but remember testing will still occur).

The role of the Operations Mamanagement Function or Department.

Before the process of making, producing or manufacturing the good or service is started, a decision has to be made on the best method of using the available factors of production. That is, how best to combine the factors, land, labour, capital and enterprise to produce the good or service.

There are several decisions to be made.

The production method to be used.
Will the production method, be batch, job, or flow? Some goods lend themselves to different methods of manufacture, but with others the decision is not so clear cut. Should we batch produce our dresses, or will we go for designer cut and prices? Will we produce 2 or 3 ranges of computers allowing the use of flow manufacturing or are we going to tailor our computers for specific customer needs?

Beyond the choice of batch or flow, the production method needs to be refined further. If flow or mass production is going to be used, will cell production be used, and all that goes with it (empowerment, job enrichment, training etc.) or shall we use traditional line production. For many firms expanding into low cost manufacturing bases in Eastern Europe (such as VW), these are decisions that have to be made today.

Capital investment required.
The type of production process will dictate the amount of capital investment required. Job production implies high labour skills, low capital investment (there are of course exceptions, such as shipbuilding), whilst mass production methods often rely on a large capital equipment base.

Location of business.
Location is becoming much more flexible, with improvements in infrastructure, communications and transportation the choice of location for the largest businesses is often world-wide.

Quality Assurance.

It is the view of world class manufacturers that quality must be 'built in'. This means that when the finished good rolls of the production line, management is confident that there is no need to check quality. The product will be of the right standard to meet the demands placed upon it.

This approach to quality has not always been widely accepted, British firms were famous for producing poor quality of output, and quality control often only occurred at the end of the production process. At this point attempts were made to rectify mistakes built in during production, and to reach the quality required. Of course this system had severe failings, costs were increased, faults were missed, and customer dissatisfaction increased. All of these leading to lost sales, lost markets and failing businesses.

Quality Assurance Methods.

There are a number quality assurance methods that can be adopted within the operations management process. These include:

- **Team working.**
- **Product design checking.**
- **Benchmarking.**
- **Application of recognised standards.**
- **Production Control.**

Team working.
A team is responsible for a production process, such as the installation of a conservatory. The team is empowered to check quality of raw materials, interact during the installation process, and check quality of finished product. This implies responsibility lies with the team - we know exactly where the 'buck stops'.

Product design checking.
We have already seen how raw materials and components are monitored for quality, but the total design of the product must also be checked for quality. The recent failure of the Mercedes A Class to reach independent test standards is an example of poor design. The problem has since been rectified, but only at great cost, both financially and in regard to corporate image. Another example was Persil Power washing powder, which was so powerful it seemed to shred and dissolve clothes - a serious design problem! Time, effort and money must be put into product design. This is the first stage, and perhaps the most important stage of building in quality.

Benchmarking.
If the highest standards are to be achieved, what standards are to be targeted? There is no point in saying that we intend to improve our standard from 1 fault in 50 to 1 fault in 100, if our competitors are achieving 1 fault in 1000. This is where benchmarking comes in. Benchmarking is the process of setting standards of quality and output based on the best that competitors can offer.

The first stage in the benchmarking process is discovering the appropriate figures for competitors. This information may be hard to come by, but research organisations should be able to produce figures on competitors levels of sales, quality, and consumer satisfaction.

The second stage in the benchmarking process is applying the figures, which have become targets, to the manufacturing process. Methods of production need to be designed, which ensure that the benchmark levels of productivity and quality are achieved.

The final stage in benchmarking is gaining a commitment from the work force. All levels of hierarchy must be commited to the achievement of these standards.

The great advantage of benchmarking is that targets set, are based on the activities of competition. This increases the focus on the market, and so increases market orientation.

Application of recognised standards.

The use of recognised standards such as BS5750, and ISO 9000 is widespread amongst businesses. Achievement of these standards by businesses is often an indication of achievement and maintenance of quality.

BS 5750 is supposed to guarantee quality of management of the whole organisation. Achievement of this standard depends on proving that quality targets for all part of the organisation have been met. But critics often state that if low levels of target are set, then there is no real guarantee of quality. Another failing of using recognised standards to achieve quality is that unless targets are related to external benchmarks, then the quality process only results in increased product orientation, when often what is required is increased market orientation.

Production Control.

This is the method of ensuring that standards set, and processes designed to meet these targets, are actually being used in the workplace.

Production control involves:

- Monitoring of costs through use of budgeting and variance analysis.
- Control of operations through use of critical path analysis and monitoring of individual processes.
- Supervision of output (now largely replaced by cell and team working),
- Feedback methods, involving monitoring of customer satisfaction, and the feedback of problems to the relevant department.

These methods of control have now spread from manufacturing industry to service industries, and has found a new home in call centres.

Call centres are centralised departments that deal with customer enquiries, provide information, or sell products. For example Virgin NTL, the cable television / Telephone / Broadband company, will have perhaps 4 or 5 call centres each employing 100's of workers giving customers information on services provided. Each worker will have a requirement to answer calls in a specific period of time, spend a certain amount of time on each call, and achieve a targeted level of sales. IT allows the performance of each worker to be monitored, and any variation from required standards and targets will be responded to by management. Workers will be retrained to ensure that standards will be met.

Benefits of Quality Assurance

- Increased Customer Satisfaction
- Reduced waste
- Reduced costs
- Increased sales and market share
- Increased market orientation

All resulting in a 'world class' business

Conclusion.

Achieving quality is a complex task, and is virtually a science in itself. We have seen that effective quality control involves monitoring of the whole production process, feedback of requirements from marketing, management of resources, and the use of external standards. The overall objective is efficiency of operation, producing quality of output, and improving productivity, all of which help the firm meet and satisfy market needs.

Notes