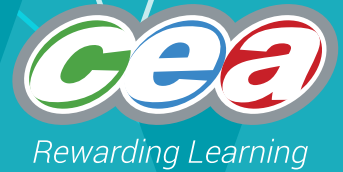


FACTFILE: GCSE

Technology and Design

OPTION C: PRODUCT DESIGN



2.43 Scale of production and commercial viability

Learning Outcomes

You should be able to:

- understand and discuss the main characteristics of quality assurance and quality control.

Quality assurance

Quality assurance is different to quality control. Quality assurance does not check the quality of the final product but the quality of all systems on the production line, staff training and quality monitoring.

Quality assurance is simply maintaining a desired level of quality in a product, by means of a series of checks carried out at each stage of the production process. This system of checks is designed to ensure that products are free of faults. A quality assurance system involves regular inspections that test and monitor:

- the quality;
- accuracy; and
- if the product is fit for purpose.

from the design stage through to manufacture.



Critical control points

Quality control checks the quality of the product at different stages of production. These checks take place at critical control points (CCPs) in a product's manufacture. The following are typical CCPs in the manufacturing process.

Raw materials

Raw materials are tested to make sure they have the desired properties and characteristics required by the product. The materials will be tested in the selection process for such characteristics as strength and durability etc. The raw materials will be monitored to identify faults or impurities throughout the production stage and rejected if not suitable.

Prototype

The prototype is a mock-up of the product used to test a design to:

- identify how materials and components behave;
- to test an assembly process;
- estimate costs; and
- test if product is fit for purpose in everyday use.

Production

During production, checks are made on the component parts of the product to check that they meet the tolerance stated in the product specification.

The use of expensive alloy tubing is an integral part of modern manufacturing. In the manufacture of the tubing for the aircraft industry it is essential to be accurate and precise. Quality assurance checks

must ensure that:

- the equipment used to manufacture the product;
- the training of staff;
- the selection of quality materials and;
- the manufacturing processes are all to the highest possible standard.

The level and quality of staff training is also assessed by the Quality assurance manager. A selection of the workers are interviewed and questioned about how they ensure the quality of their own work. S/he will examine samples of work they have completed after attending training courses run by the company helping them to assess the quality of the training courses and instruction.

The Quality assurance manager may also carry out 'spot checks' in relation to the quality of the materials ordered for the production line. Their interest is in how the department that orders materials are constantly checking quality, and how they ensure that only the best materials are allowed into the factory and on to the production line.

The benefits of a quality assurance system

Reduced waste

Quality assurance systems can identify areas that create waste. When the company reduces the number of defective products, it experiences waste reduction resulting in savings. The identification of defects early in the production process decreases manufacturing cost to the company.

Time Efficiency

A quality assurance team is separate from the production group, and can therefore be objective in identifying time-wasting areas during production.

Increased Customer Satisfaction

The quality assurance system improves the quality of products, which increases customer satisfaction. Customer satisfaction leads to repeat business, customer referrals, increased sales and profits.

A quality assurance system can eliminate defective products and continuously evaluates the process to improve products. Quality assurance can result in a consistently reliable product.

Increased reliability in the product results in customer satisfaction and brand loyalty.

Companies with reliable quality gain a favourable reputation with consumers.

Improved Employee Morale

Employee morale is higher in a company using a quality assurance system according to the National Institute of Accountants. A system of quality assurance, such as Total Quality Management, involves employees in the process. Employees in turn become stakeholders in the organization and its success. Improved employee morale results in less absenteeism and turnover among workers.

Quality control

In manufacturing, quality control is a process used to ensure products meet a company's quality requirements before they are sold.

Quality control in manufacturing emphasises the importance of thoroughly examining and testing the quality of products to find defects. Companies that use quality control in manufacturing processes typically have a team of workers who focus on testing a number of products at random to determine whether they meet the company's standards. The failure of some companies to use a quality control system can be costly. Product recalls from Toyota, Volkswagen and Firestone had a financial cost although the damage to their reputation may have been greater.

Companies with quality control procedures in place are far less likely to face product recalls. The cost associated with these recalls can be huge. In the USA in 2009, Toyota had to recall 12.4 million cars for faulty accelerator pedals and floor mats that could jam accelerators, at a cost of approximately £1.5 billion. This could have been avoided had quality control been properly implemented.

Implementing quality control

To implement an effective quality control program, a company should first decide;

- the quality standards the product is required to meet;
- the percentage of each batch of products to be tested;
- the testing by designated employees; and
- reporting the results to management.

Product quality testing methods will vary greatly depending on the type of products the company manufactures.

Remedial Actions

If defective products are found, management must decide whether to:

- repair or reject those products;
- bring production to a halt until the problem is corrected; and
- review the quality assurance process and see why the problem was not prevented.

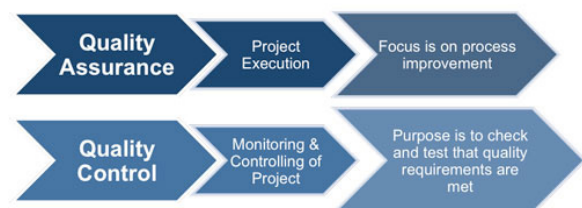
Management must ensure the quality assurance and quality control in manufacturing processes are ongoing to ensure all defects are identified and removed and to detect new product defects as they appear.

The benefits of using quality control in manufacturing

The most obvious beneficiary of quality control is the customer, who receives a high-quality product. This in turn benefits the company by ensuring customer satisfaction, leading to repeat business, customer loyalty, and the creation of a reputation in relation to the quality of the company's product. Therefore, quality control in manufacturing pays off for a company in both reputation and revenue.

Summary

The aim of quality assurance is to streamline a production process to ensure the finished products are more likely to meet the company's quality criteria. The difference between quality control and quality assurance is that quality control evaluates the finished product, while quality assurance ensures the manufacturing process will produce high quality products. Quality assurance can be combined with quality control to avoid the limitations of using only quality control in manufacturing.



Source: <http://www.free-management-ebooks.com/images/pmdl0504.jpg>

Revision questions

1. What is Quality Assurance?

2. What is Quality Control?

3. How does Quality Assurance differ from Quality Control?

4. What are the benefits of Quality Control to the manufacturer?

Additional information sources

<http://www.bbc.co.uk/schools/gcsebitesize>

<https://www.parksmoving.com/about-us/quality-assurance>

<http://www.technologystudent.com>

<https://www.graphicproducts.com>

