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What is quality?

Consumers, faced with many goods or services at similar prices, are likely to consider QUALITY when making choices. Quality could be described as those features of a product or service that allow it to satisfy customers' wants. Take an example of a family buying a television. They may consider some of the following features:

- physical appearance – they may want a certain style;
- reliability and durability – will it last for 10 years?
- special features – does it have stereo sound?
- suitability – they may want a portable television;
- parts – are spare parts available?
- repairs – does the shop carry out maintenance?
- after sales service – how prompt is delivery?

They may also consider features which they perceive as important, such as:

- image – is the manufacturer's name widely recognised?
- reputation – what do other consumers think of the business or product?

The importance of quality has grown in recent years. Consumers are more aware. They get information through magazines such as *Which?* that contain reports on the quality of certain products. They also have more disposable income and higher expectations than ever before. Legislation and competition have also forced firms to improve the quality of their products.

Businesses, faced with competition, are also concerned about the quality of their:

- design – the ideas and plans for the product or service;
- production processes – the methods used to manufacture the goods or provide the services.

Poor designs may lead to problems with the materials and the functions of the finished good or service. It costs time and money to redesign poor products. Clients are unlikely to use businesses with poor designs again. Problems also occur with poor quality production processes. Faulty products are costly for a business. Machinery that breaks down or constantly needs to be repaired will also be expensive. Late delivery and ineffective productivity that results in poor quality can harm a business's reputation.

Traditional quality control

Traditionally, in manufacturing, production departments have been responsible for ensuring quality. Their objectives might have been to make sure that products:

- satisfied consumers' needs;
- worked under conditions they were likely to face;
- operated in the way they should;
- could be produced cost effectively;



Question 1.

Airbus S.A.S. is the aircraft manufacturing subsidiary of EADS N.V., a pan-European aerospace business. Based at Toulouse, France with significant operations in other European states, Airbus produces around half of the world's jet airliners. Airbus employs around 57,000 people at sixteen sites in four European countries. Airbus' customers expect quality in the aircraft they buy. Safety, reliability, comfort and maintenance costs are key areas where quality is crucial in an airline's judgment of an aircraft. To achieve the very highest standards in these and other aspects of an aircraft's performance the question of quality is addressed by Airbus at every stage, from design to final assembly and beyond. Repeated checks are made. Tests are applied. Airbus ensures every supplier of parts meets the strictest standards on quality. Defective work, parts and materials are rejected.

Delivering aircraft on time, on cost and on quality – getting it right first time – is the goal Airbus continually strives for. Airbus has a network of key employees who identify problems at various stages of design, production and assembly and recommend action to eradicate them, pre-empting possible costly delays at a later point. These employees also ensure continuous improvement in standards and efficiency by pinpointing ways in which people could work better or tools and materials could be improved. As it raises production to meet demand, Airbus knows setting even higher standards in quality is critical to maintaining its success.

Source: adapted from www.airbus.com.

- (i) What features do customers of Airbus consider important when buying aircraft?
(ii) Which of the features in (i) do you think is the most important?
- (b) What measures does Airbus take to meet the high quality aspirations of customers?

- could be repaired easily;
- conformed to safety standards set down by legislation and independent bodies.

At Kellogg's, the cereal manufacturer, for example, samples of breakfast cereal have, in the past, been taken from the production line every half hour and tested. The testing took place in a food review room twice a day and was undertaken by a small group of staff. Each sample, about 50 in total, was compared with a 'perfect' Kellogg's sample and given a grade between 1 and 10. 10 was perfect but between 9.8 and 7, although noticeable to the trained eye, was acceptable to the customer. Below 7 the consumer would notice the reduction in quality. The cereals were tested for appearance, texture, colour, taste etc. More sophisticated tests were carried out in a laboratory where the nutritional value of a sample, for example, was measured.

QUALITY CONTROL in UK organisations, in the past, often meant **quality controllers** or **quality inspectors** checking other people's work and the product itself after production had taken place. By today's standards this is not quality control, but a method of finding a poor quality product (or a problem) before it is sold to the consumer.

Quality assurance

Today businesses are less concerned about 'Has the job been done properly?' than 'Are we able to do the job properly?' In other words inspection is carried out during the production process. This means that problems and poor quality products can be prevented before final production.

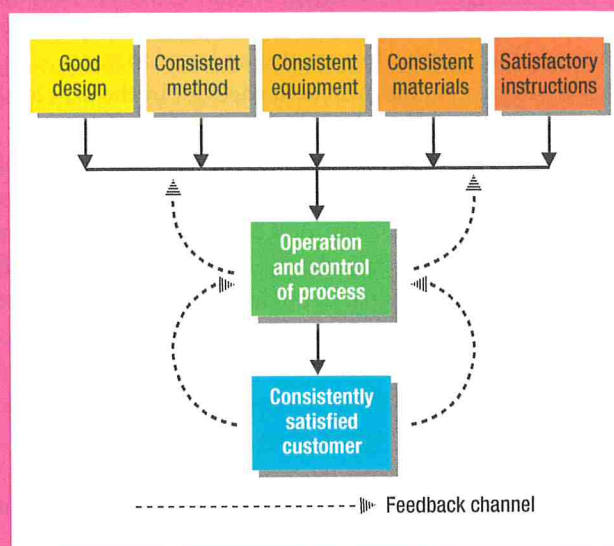
Such a preventative approach has been used by Japanese businesses and is known as TOTAL QUALITY MANAGEMENT (TQM). It is now being adopted by many companies in the UK. It involves all employees in a business contributing to and being responsible for ensuring quality at all stages in the production process. QUALITY ASSURANCE is a commitment by a business to maintain quality throughout the organisation. The aim is to stop problems before they occur rather than finding them after they occur.

Quality assurance also takes into account customers' views when planning the production process. For example, customers may be consulted about their views through market research before a product is manufactured or a service provided. They may also be part of a consultation group involved at the design and manufacturing stage.

Total quality management

Errors are costly for business. It is estimated that about one-third of all the effort of British businesses is wasted in correcting errors. There are benefits if something is done right the first time. Total quality management (TQM) is a method designed to prevent errors, such as the creation of poor quality products, from happening. The business is organised so that the manufacturing process is investigated at every stage. It is argued that the success of Japanese companies is based on their superior

Figure 1: The systematic approach to quality management



organisation. Every department, activity and individual is organised to take into account quality at all times. What are the features of TQM?

Quality chains Great stress is placed on the operation of QUALITY CHAINS. In any business a series of suppliers and customers exists. For example, a secretary is a supplier to a manager, who is the customer. The secretarial duties must be carried out to the satisfaction of the manager. The chain also includes customers and suppliers outside the business. The chain remains intact if the supplier satisfies the customer. It is broken if a person or item of equipment does not satisfy the needs of the customer. Failure to meet the requirements in any part of the quality chain creates problems, such as delays in the next stage of production.

Company policy, accountability and empowerment There will only be improvements in quality if there is a company-wide quality policy. TQM must start from the top with the most senior executive and spread throughout the business to every employee. People must be totally committed and take a 'pride in the job'. This might be considered as an example of job enrichment. Lack of commitment, particularly at the top, causes problems. For example, if the managing director lacks commitment, employees lower down are unlikely to commit themselves. TQM stresses the role of the individual and aims to make everyone accountable for their own performance. For example, a machine operator may be accountable to a workshop supervisor for his work. They may also be empowered to make decisions.

Control Consumers' needs will only be satisfied if the business has control of the factors that affect a product's quality. These may be human, administrative or technical factors, shown in Figure 1. The process is only under control if materials, equipment and tasks are

used in the same way every time. Take an example of a firm making biscuits. Only by cooking in the same way can the quality be consistent every time.

These methods can be documented and used to assess operations. Regular audits must be carried out by the firm to check quality. Information is then fed back from the customer to the 'operator' or producer, and from the operator to the supplier of inputs, such as raw materials. For example, a retailer may return a batch of vehicles to the manufacturer because the gears were faulty. The manufacturer might then identify the person responsible for fitting the gears. An investigation might reveal that the faulty gears were the responsibility of a component supplier. The supplier can then be contacted and the problem resolved. Quality audits and reviews may lead to suggestions for improvements - a different material, perhaps, or a new piece of equipment.

Monitoring the process TQM relies on monitoring the business process to find possible improvements. Methods have been

Question 2.

Compsoft is a UK-based company which produces tailor-made data management software for high-growth businesses. One of Compsoft's first products was Delta, a market-leading DOS-based database which is still used by many organisations today. Compsoft also developed Equinox, a rapid application development tool and database environment. Equinox is used by SMEs, blue-chip companies and governmental bodies.

Compsoft is committed to quality assurance and has been awarded ISO 9001, the internationally recognised standard for the quality management of businesses. As a result Compsoft has adopted the BSI framework to monitor its business processes to ensure the quality of service provided to its customers. Some of the basic requirements of certification include:

- adapting a set of procedures that cover all key processes in the business;
- monitoring development processes to ensure they are producing quality products;
- keeping records;
- checking outgoing applications for defects, with appropriate corrective action where necessary;
- regularly reviewing individual processes and the quality system itself for effectiveness;
- facilitating continual improvement.

Regular monitoring ensures that these standards are upheld and that Compsoft remains worthy of its title as an accredited ISO 9001 provider.

Source: adapted from www.compsoft.co.uk.

- (a) (i) What is quality assurance?
(ii) How does Compsoft ensure quality in its business?
- (b) What role does the BSI play in Compsoft's quality assurance?
- (c) What benefits might Compsoft enjoy as a result of ISO 9001 certification?

developed to help achieve this. STATISTICAL PROCESS CONTROL (SPC) involves collecting data relating to the performance of a process. Data is presented in diagrams, charts and graphs. The information is then passed to all those concerned.

SPC can be used to reduce variability, which is the cause of most quality problems. Variations in products, delivery times, methods, materials, people's attitudes and staff performance often occur. For example, statistical data may show that worker attitudes may have led to variations in output late on Friday afternoon. Discussion might result in a change in the 'clocking on' and 'clocking off' times to solve the problem.

Teamwork TQM stresses that teamwork is the most effective way of solving problems. The main advantages are:

- a greater range of skills, knowledge and experience can be used to solve the problem;
- employee morale is often improved;
- problems across departments are better dealt with;
- a greater variety of problems can be tackled;
- team 'ideas' are more likely to be used than individual ones.

TQM strongly favours teamwork throughout the business. It builds trust and morale, improves communications and cooperation and develops interdependence. Many UK firms in the past have suffered due to lack of sharing of information and ideas. Such approaches have often led to division between sections of the workforce.

Consumer views Firms using TQM must be committed to their customers. They must be responsive to changes in people's needs and expectations. To do this, information must be gathered on a regular basis and there must be clear communication channels for customers to express their views. Consumers are often influential in setting quality standards. For example, holiday companies issue questionnaires to their customers on the way back from a package holiday. The information can be used to identify the strengths and weaknesses of their operations. Such information can be used to monitor and upgrade quality standards.

Zero defects Many business quality systems have a zero defect policy. This aims to ensure that every product that is manufactured is free from defects. A business that is able to guarantee zero defects in customers' orders is likely to gain a good reputation. This could lead to new clients and improved sales.

Quality circles TQM stresses the importance of teamwork in a business. Many businesses have introduced quality circles into their operations. Quality circles are small groups of staff, usually from the same work area, who meet on a regular and voluntary basis. They meet in the employer's time and attempt to solve problems and make suggestions about how to improve various aspects of the business. Issues such as pay and conditions are normally excluded. After discussions, the team will present its ideas and solutions to management. Teams are also involved in implementing and monitoring the effectiveness of solutions. In

der for quality circles to be successful certain conditions must

st.

- A steering committee should be set up to oversee the whole quality circle programme.
- A senior manager should ideally chair the committee. Managers must show commitment to the principle of quality circles.
- At least one person on the committee should be accountable for the programme.
- Team leaders should be properly trained.

ing **TQM** TQM helps companies to:

- focus clearly on the needs of customers and relationships between suppliers and customers;
- achieve quality in all aspects of business, not just product or service quality;
- critically analyse all processes to remove waste and inefficiencies;
- find improvements and develop measures of performance;
- develop a team approach to problem solving;
- develop effective procedures for communication and acknowledgement of work;
- continually review the processes to develop a strategy of constant improvement.

There are, however, some problems.

- There will be training and development costs of the new system.
- TQM will only work if there is commitment from the entire business.
- There will be a great deal of bureaucracy and documents and regular audits will be needed. This may be a problem for small firms.
- Stress is placed on the process and not the product.

0 standards

Businesses can work to quality assurance **codes of practice**.

These show that a production process has been carried out to a certain standard and to the required specification. Once a business has been assessed and has achieved a certain standard, it is regularly checked by the awarding organisation to make sure standards are maintained. ISO 9000 is an international standard which businesses seek to achieve.

The **British Standards Institution** (BSI) is an independent organisation that attempts to set quality standards in industry. The BSI and other independent bodies, such as Lloyds, offer BS EN ISO 9000 registration. The title reflects the European (EN) and international (ISO) recognition for this series. BS EN ISO 9001 gives quality assurance in design, development, production, installation and servicing and is suitable for businesses which have a large element of design in their operations. BS EN ISO 9002 gives quality assurance in production, installation and servicing, for businesses which produce fairly standard products with little or no design. BS EN ISO 9003 gives quality assurance in final inspection and

testing. This standard is suitable for small firms or where customers can check quality themselves through inspection.

Firms seeking certification have to show that their methods and procedures meet the recognised standards and comply with requirements. They are inspected on a regular basis to make sure that standards are being maintained. BS EN ISO 9000 certification can help a business to:

- examine and improve systems, methods and procedures to lower costs;
- motivate staff and encourage them to get things right first time;
- define key roles, responsibilities and authorities;
- ensure that orders are consistently delivered on time;
- highlight product or design problems and develop improvements;
- record and investigate all quality failure and customer complaints and make sure that they do not reoccur;
- give a clear signal to customers that it is taking measures to improve quality;
- produce a documented system for recording and satisfying the training needs of new and existing staff regarding quality.

Product standards

Businesses may include signs and symbols on their products which tell a customer about the product's standards. Certain bodies have also been set up to ensure the quality of goods and services.

British Standards Institution Any business can apply to the BSI for an inspection of its product. Those that achieve and maintain a standard can carry the BSI Kitemark. The Kitemark tells the customer that the product has been tested to destruction, to ensure that it meets with certain safety standards. Products that carry a Kitemark include some cricket helmets, kitchen units, child car safety seats, door locks, curtains, and sofa and duvet covers.

The BSI also issues a number of other product standards. These include ensuring:

- products conform to yachting standards;
- the tensile strength of yarns;
- performance levels for the amount of UV light through sunglasses;
- grades of carpet pile, according to quality and durability.

The British Electrotechnical Approvals Board (BEAB) Now part of Intertek, a global leader in testing, inspection and certification, this is a body which inspects domestic electrical equipment. Manufacturers of domestic electrical appliances will be keen for the BEAB to approve their products. Approval can serve as a recognition of quality that customers will recognise.

The Association of British Travel Agents (ABTA) The Association of British Travel Agents is a trade association which

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has drawn up a code of practice for its members. The code aims to improve the trading standards of activities related to the sale of holidays. Travel agents are allowed to register with ABTA if they agree to follow its code of practice.

The Wool Marketing Board This allows manufacturers to carry labels such as the Wool Mark if their garments are made entirely of pure new wool. Obtaining a trademark is a way for a firm to give quality assurance to customers. If customers know that the quality of a product is guaranteed, they are more likely to buy the product. Also, there is less need to inspect the product, and returns and re-ordering are reduced.

The British Toy and Hobby Association (BTHA) developed the Lion Mark as a symbol of toy safety to be displayed on toy packaging. Toy manufacturers that want to include the Lion Mark must take out a licence with the BTHA. The manufacturer must sign a strict code of practice which sets standards relating to toy safety and advertising, as well as counterfeiting and markings on toy guns. The Lion Mark was adapted by the BTHA and the British Association of Toy Retailers (BATR) for shops. If the symbol is displayed in a shop it indicates that the retailer has agreed to a strict code of practice. They agree only to offer safe toys for sale and to ensure staff are briefed on toy safety matters such as age warnings.

The Consumers Association This is a body which follows up complaints by people about faulty products or services. It also makes recommendations about products and services to customers. These take into account such things as quality, reliability and value for money. Often survey results appear in its *Which?* magazine.

The Institute of Quality Assurance (IQA) The Institute of Quality Assurance is a professional body in the UK whose purpose is the promotion and advancement of quality practices. The IQA has three main objectives.

- To seek the advancement of quality management and practices and help the exchange of related information and ideas.
- To promote the education, training, qualification and development of people involved in quality assurance and the management of quality.
- To provide a range of services to members and, where appropriate, to the community at large.

Some businesses support their products with **WARRANTIES**. If goods are warranted, it means that the manufacturer will undertake any necessary work arising from a defect in the product 'free of charge'. Warranties are popular with products such as cars and a wide range of electrical appliances.

A number of laws exist which protect consumers from poor trading practices. They have tended to focus on safety aspects and consumer exploitation. However, increasingly UK laws and EU regulations are taking into account product quality. Existing

laws are enforced by local inspectors, called **Trading Standards Officers**.

Poka-Yoke

Poka-Yoke (meaning 'inadvertent mistake' and 'prevent' in Japanese) is a quality assurance technique developed by manufacturing engineer Shigeo Shingo. It aims to eliminate defects in products by preventing or correcting mistakes as early as possible. While visiting the Yamada Electric plant in Japan, Shingo was told about a problem with the assembly of a product that had a switch with two push-buttons supported by springs. Sometimes workers assembling the switch would forget to insert a spring under each push-button. The error would not be found until the product reached a customer, which was embarrassing and expensive.

Shingo suggested a solution that became the first poka-yoke technique. In the old method, workers began by taking two springs out of a large parts box and then assembling the switch. In the new approach, a small dish is placed in front of the parts box and the workers' first task is to take two springs out of the box and place them on the dish. Workers then assemble the switch. If springs remain on the dish, workers know they have forgotten to insert them. Poka-yoke techniques fall into two categories.

- A **prevention** device makes it impossible to make a mistake at all. An example is in the design of a 3.5 inch computer disk. The disk is designed to be asymmetrical, so it will not fit into the disk drive in any other way than the correct one. Prevention devices remove the need to correct a mistake, since one has not been made in the first place.
- A **detection** device warns workers when a mistake has been made, so that the problem can be corrected. The small dish used at the Yamada Electric plant was a detection device. Another example would be an alarm that sounds in a car when the seat belt is not fastened.

Costs and benefits of ensuring quality

Firms will want to monitor the costs of quality control carefully. All businesses are likely to face costs when trying to maintain or improve the quality of their products and services.

- The cost of designing and setting up a quality control system. This might include the time used to 'think through' a system and to train staff to use it.
- There might be a cost in terms of lost production. When a business introduces a major new system there may be some serious disruption while the new system is 'bedded-in'. This could lead to a loss of output and damage to customer relations if orders are not met.
- The cost of monitoring the system. This could be the salary of a supervisor or the cost of an electronic sensor.
- There will be costs if products do not come up to standard. Faulty goods may have to be scrapped or reworked. Product failures might also result in claims against a company, bad publicity and a possible loss of goodwill.

- The cost of improving the actual quality. This may be the cost of new machinery or of training staff in new working practices.
- If the whole quality system fails, there may be costs in setting it up again. Time may be needed to 'rethink' or adjust the system. Retraining might also be necessary.
- Quality initiatives will only be successful if the people involved in their implementation are properly trained. This can prove very costly. For example, if TQM is introduced the entire workforce will have to be trained. This may involve sending all staff on specialist training courses or outsourcing training to an expert in TQM.

It has been suggested that between 10-20 per cent of the revenue of a business is accounted for by quality related costs. This means that UK businesses could save billions of pounds by cutting such costs. The vast majority of these costs is spent on appraisal and failure, which add very little to the quality of the product. Eliminating failure will also help to reduce appraisal and failure costs.

Although quality control systems are costly, it is argued that their benefits outweigh the costs. The actual quality of the product should be improved, so customers are more likely to purchase the product. Business costs may be cut if faults in products are identified before the product reaches the market. The costs of failure once the product has reached the market are likely to be much higher than those incurred during manufacture.

Quality, USP and pricing flexibility

Some businesses use quality as a means of developing a unique selling point (USP). If a business can differentiate its product on grounds of quality and persuade the customer that its product is superior to its rivals, it may enjoy some benefits. One of the main benefits is the ability to charge a higher price. If consumers are convinced that a product is superior in quality to those of its rivals, they are often prepared to pay higher prices. This gives a business more flexibility in pricing. For example, Porsche, the performance car manufacturer, has a global reputation for high quality. Consequently it is able to charge premium prices for their range of sports cars.

KEY TERMS

Quality – features of a product that allow it to satisfy customers' needs. It may refer to some standard of excellence.

Quality assurance – a method of working for businesses that takes into account customers' wants when standardising quality. It often involves guaranteeing that quality standards are met.

Quality chains – created when employees form a series of links between customers and suppliers in business, both internally and externally.

Quality control – making sure that the quality of a product meets specified quality performance criteria.

Statistical process control – the collection of data about the performance of a particular process in a business.

Total quality management – a managerial approach which focuses on quality and aims to improve the effectiveness, flexibility, and competitiveness of a business.

Warranties – guarantees that faulty products will be repaired or replaced within a period of time.

KNOWLEDGE

1. What is meant by the quality of a product?
2. Explain the difference between actual and perceived quality.
3. Explain the difference between quality control and quality assurance.
4. State 5 implications of TQM for a business.
5. Why is teamwork so important in TQM?
6. How does ISO 9000 affect a business?
7. What is the role of the British Standards Institution?
8. Explain the advantage of manufacturing trademarks to a business.
9. What are the costs and benefits of ensuring quality?