



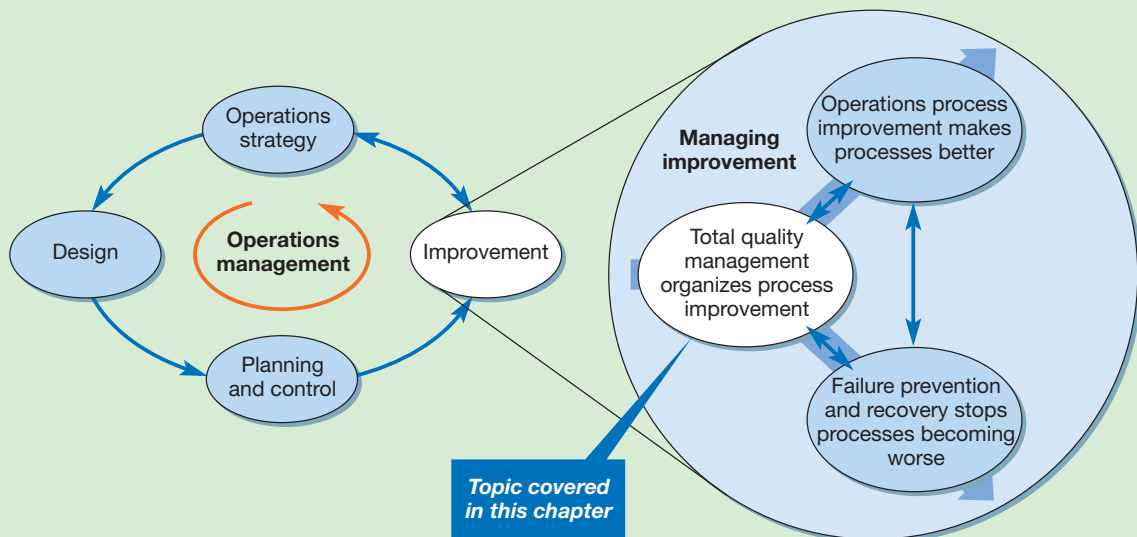
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# Chapter 20

## Managing improvement – the TQM approach

### Introduction

Total quality management (TQM) has probably been the most significant approach to managing operations improvement. Few, if any, managers in any developed economy have not heard of TQM and its impact on avoiding errors. But ‘total quality management’ has come to mean more than avoiding errors. It is also seen as an approach to the way operations and processes should be managed and, more significantly, improved generally. This is because quality management focuses on the very fundamental of operations and process management – the ability to produce and deliver the products and services that the market requires, both in the short and long term. A grasp of quality management principles is the foundation of any improvement activity (see Figure 20.1).



**Figure 20.1** This chapter covers the management of improvement using the ideas of total quality management (TQM)

## Key questions ???

- Where did the idea of total quality management (TQM) come from?
- What are the main differences between traditional quality management and TQM?
- What is the role of ISO 9000 in TQM?
- What are the main implementation issues in TQM initiatives?
- How do quality awards and models contribute towards TQM?

## Operations in practice

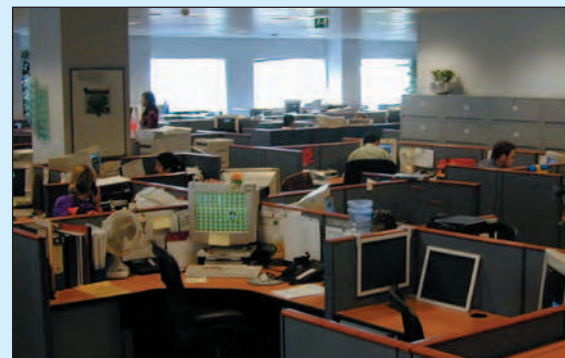
### Taxing quality<sup>1</sup>



Operations effectiveness is just as important an issue in public sector operations as it is for commercial companies. People have the right to expect that their taxes are not wasted on inefficient or inappropriate public processes. This is especially true of the tax-collecting system itself. It is never a popular organization in any country and tax payers can be especially critical when the tax-collection process is not well managed. This was very much on the minds of the Aarhus Region Customs and Tax unit (Aarhus CT) when it developed its award-winning quality initiative. The Aarhus Region is the largest of Denmark's 29 local customs and tax offices. It acts as an agent for central government in collecting taxes in a professional and efficient manner while being able to respond to tax payers' queries. Aarhus CT must 'keep the user (customer) in focus,' they say. 'Users must pay what is due – no more, no less and on time. But users are entitled to fair control and collection, fast and efficient case work, service and guidance, flexible employees, polite behaviour and a professional telephone service.'

The Aarhus CT approach to managing its quality initiative was built around a number of key points:

- a recognition that poor quality processes cause waste both internally and externally;
- a determination to adopt a practice of regularly surveying the satisfaction of its users. Employees were also surveyed, both to understand their views on quality and to check that their working environment would help to instil the principles of high-quality service;
- although a not-for-profit organization, quality measures included measuring the organization's adherence to financial targets as well as error reporting;
- internal processes were redefined and redesigned to emphasize customer needs and internal staff requirements. For example, Aarhus CT was the only tax region in Denmark to develop an independent information process that was used to analyze customers' needs and 'prevent misunderstanding in users' perception of legislation';



- internal processes were designed to allow staff the time and opportunity to develop their own skills, exchange ideas with colleagues and take on greater responsibility for management of their own work processes;

The organization set up what it called its 'Quality Organization' (QO) structure that spanned all divisions and processes. The idea of the QO was to foster staff commitment to continuous improvement and to encourage the development of ideas for improving process performance. Within the QO was the Quality Group (QG). This consisted of four managers and four process staff and reported directly to senior management. It also set up a number of improvement groups and suggestion groups consisting of managers as well as process staff. The role of the suggestion groups was to collect and process ideas for improvement which the improvement groups would then analyze and if appropriate implement.

Aarhus CT were keen to stress that the Quality Groups would eventually become redundant if they were to be successful. In the short term they would maintain a stream of improvement ideas, but in the long term they should have fully integrated the idea of quality improvement into the day-to-day activities of all staff.

## TQM and the management of improvement

### Total quality management (TQM)

A holistic approach to the management of quality that emphasizes the role of all parts of an organization and all people within an organization to influence and improve quality; heavily influenced by various quality 'gurus', it reached its peak of popularity in the 1980s and 1990s.

**Total quality management** was one of the earliest of the current wave of management 'fashions'. Its peak of popularity was in the late 1980s and early 1990s. As such it has suffered from something of a backlash in recent years and there is little doubt that many companies adopted TQM in the simplistic belief that it would transform their operations performance overnight. Yet TQM, or more properly the general precepts and principles that constitute TQM, is still the dominant mode of organizing operations improvement. That is why we treat the topic within the overall activity of 'improvement'. So, the approach we take here is to stress the importance of the 'total' in total quality management and how it can guide the agenda for improvement.

### TQM and the quality gurus

The notion of total quality management was introduced by Feigenbaum in 1957. It was then developed further by several so-called 'quality gurus'. Each 'guru' stressed a different set of issues, from which emerged the TQM approach to operations improvement. To understand the origins of TQM, it is worth briefly describing the contributions from these quality pioneers.

**A. Feigenbaum** was a doctoral student at the Massachusetts Institute of Technology in the 1950s when he completed the first edition of his book *Total Quality Control*. He defines TQM as '*an effective system for integrating the quality development, quality maintenance and quality improvement efforts of the various groups in an organization so as to enable production and service at the most economical levels which allow for full customer satisfaction*'.<sup>2</sup> Despite his early writings in America, it was the Japanese who first made the concept work on a wide scale and subsequently popularized the approach and the term 'TQM'.

**W.E. Deming** considered in Japan to be the father of quality control, asserted that quality starts with top management and is a strategic activity.<sup>3</sup> It is claimed that much of the success in terms of quality in Japanese industry was the result of his lectures to Japanese companies in the 1950s.<sup>4</sup> Deming's basic philosophy is that quality and productivity increase as 'process variability' (the unpredictability of the process) decreases. In his *14 points for quality improvement*, he emphasizes the need for statistical control methods, participation, education, openness and purposeful improvement:

- 1 Create constancy of purpose.
- 2 Adopt new philosophy.
- 3 Cease dependence on inspection.
- 4 End awarding business on price.
- 5 Improve constantly the system of production and service.
- 6 Institute training on the job.
- 7 Institute leadership.
- 8 Drive out fear.
- 9 Break down barriers between departments.
- 10 Eliminate slogans and exhortations.
- 11 Eliminate quotas or work standards.
- 12 Give people pride in their job.
- 13 Institute education and a self-improvement programme.
- 14 Put everyone to work to accomplish it.

**J.M. Juran** tried to get organizations to move away from the traditional view of quality as 'conformance to specification' to a more user-based approach, for which he coined the phrase 'fitness for use'. He pointed out that a dangerous product could conform to specification but would not be fit to use. Juran was concerned about management responsibility for quality, but he was also concerned about the impact of individual workers and involved himself with the motivation and involvement of the workforce in quality improvement activities.<sup>5</sup>



**K. Ishikawa** has been credited with originating quality circles and cause-and-effect diagrams (see Chapter 18). Ishikawa claimed that there had been a period of over-emphasis on statistical quality control (in Japan), and as a result people disliked quality control.<sup>6</sup> They saw it as something unpleasant because they were given complex and difficult tools rather than simple ones. Ishikawa saw worker participation as the key to the successful implementation of TQM.

**G. Taguchi** was concerned with engineering-in quality through the optimization of product design combined with statistical methods of quality control. He encouraged interactive team meetings between workers and managers to criticize and develop product design. Taguchi's definition of quality uses the concept of the loss which is imparted by the product or service to society from the time it is created. His quality loss function (QLF, see Chapter 17) includes such factors as warranty costs, customer complaints and loss of customer goodwill.<sup>7</sup>

**P.B. Crosby** is best known for his work on the cost of quality. He suggested that many organizations do not know how much they spend on quality, either in putting it right or getting it wrong. He claimed that organizations that have measured their costs say that they equate them to about 30 per cent of sales (others suggest a smaller figure of around 10 per cent). Crosby tried to highlight the costs and benefits of implementing quality programmes through his book *Quality is Free* in which he provided a *zero defects* programme.<sup>8</sup>

## Critical commentary

While some authorities see TQM's dependence on the work of quality 'gurus', other see it as a major weakness in the whole concept. Although sincere in their beliefs, many TQM gurus were consultants who made their living out of selling their own ideas. Under those circumstances there is a clear conflict of interest between a dispassionate and evidence-driven approach to examining the behaviour of organizations and the need to develop a set of simple prescriptions that managers could easily understand and implement. Moreover, by reducing quality management to a simple list of good practice ideas, it ignores the often hugely important differences in organization context. How can the same principles apply to an assembly line and a firm of chartered accountants?

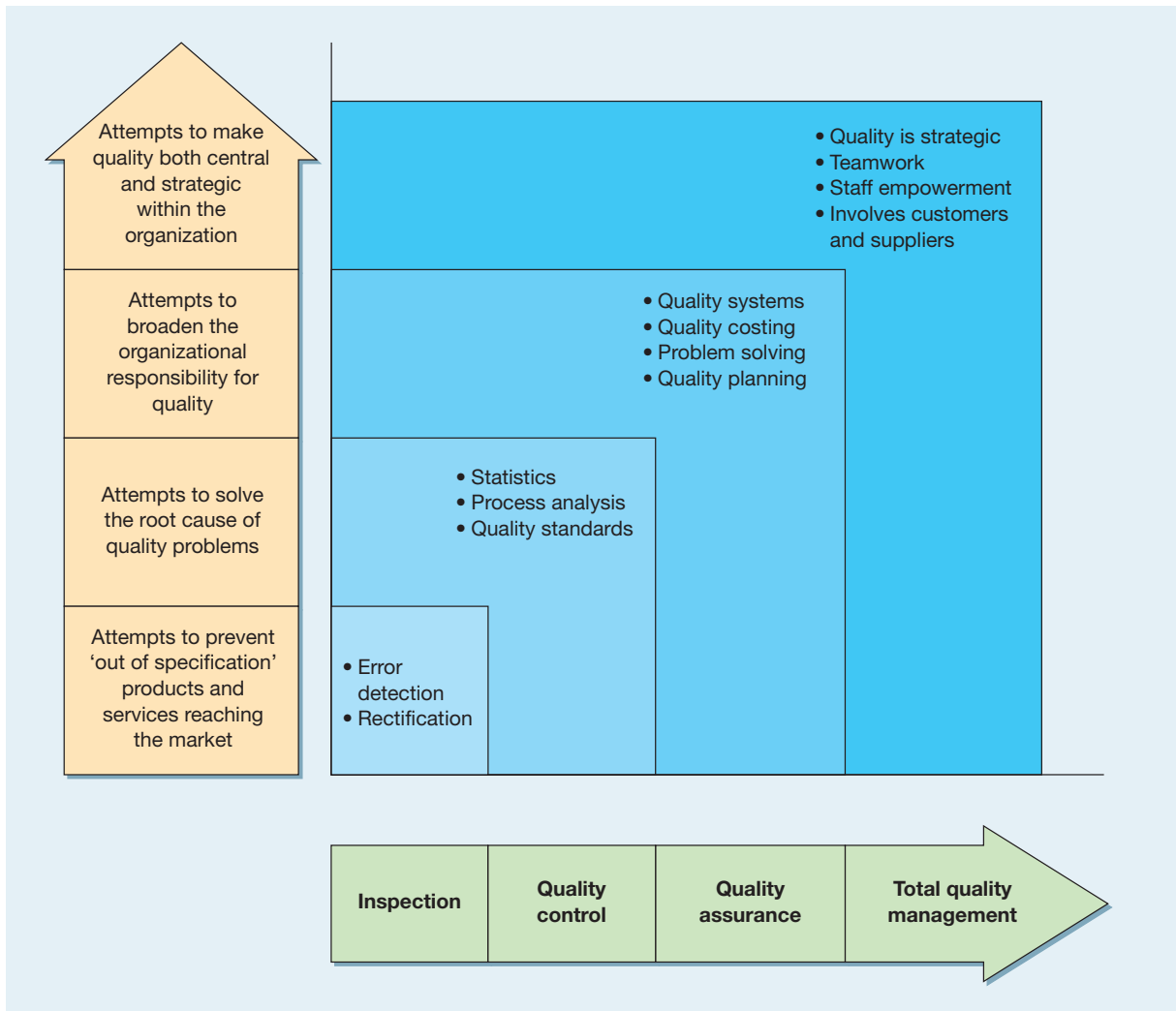
### TQM as an extension of previous practice

TQM can be viewed as a logical extension of the way in which quality-related practice has progressed (see Figure 20.2). Originally quality was achieved by inspection – screening out defects before they were noticed by customers. The quality control (QC) concept developed a more systematic approach to not only detecting but also treating quality problems. Quality assurance (QA) widened the responsibility for quality to include functions other than direct operations. It also made increasing use of more sophisticated statistical quality techniques. TQM included much of what went before but developed its own distinctive themes. We will use some of these themes to describe how TQM represents a clear shift from traditional approaches to quality.

## What is TQM?

TQM is a philosophy of how to approach the organization of quality improvement

Although the quality 'gurus' seem to be recommending different solutions to bringing about improvement, they are all talking the same 'language' but they use different dialects. In fact, TQM is best thought of as a philosophy of how to approach the organization of quality improvement. This philosophy, above everything, stresses the 'total' of TQM. It is an approach that puts quality (and indeed improvement generally) at the heart of everything that is done by an operation and including all activities within an operation. This totality can be summarized by the way TQM lays particular stress on the following:



**Figure 20.2** Total quality management can be viewed as a natural extension of earlier approaches to quality management

- meeting the needs and expectations of customers;
- covering all parts of the organization;
- including every person in the organization;
- examining all costs which are related to quality, especially failure costs;
- getting things 'right first time', i.e. designing-in quality rather than inspecting it in;
- developing the systems and procedures which support quality and improvement;
- developing a continuous process of improvement (this was treated in Chapter 18).

### TQM meets the needs and expectations of the customers

In Chapter 17 we defined quality as 'consistent conformance to customers' expectations'. Yet there is little point in putting a quality system in place – calculating costs, training and motivating people, and so on – unless it meets the requirements of the customers. Chapter 17 explained a number of ways in which organizations can find out what customer expectations are. However, in the TQM approach, meeting the expectations of customers means more than this; it means seeing things *from a customer's point of view*. This involves the whole organization in understanding the central importance of customers to its success and even to its survival. Customers are seen not as being *external* to the organization but as the most important *part* of it.

## TQM covers all parts of the organization

*For an organization to be truly effective, every single part of it, each department, each activity, and each person and each level, must work properly together, because every person and every activity affects and in turn is affected by others.<sup>9</sup>*

### Internal customer

Processes or individuals within an operation who are the customers for other internal processes or individuals' outputs.

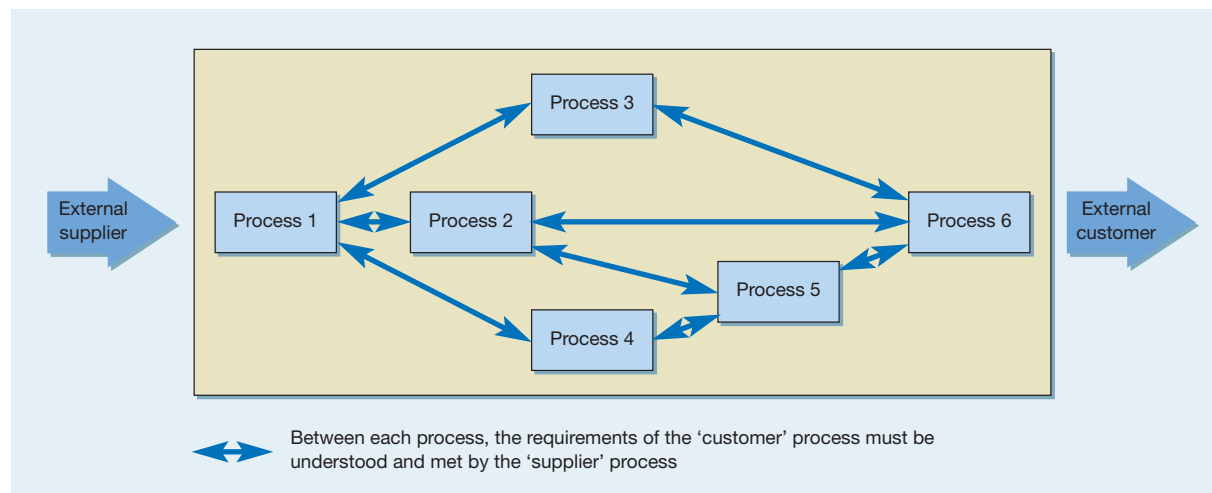
### Internal supplier

Processes or individuals within an operation that supply products or services to other processes or individuals within the operation.

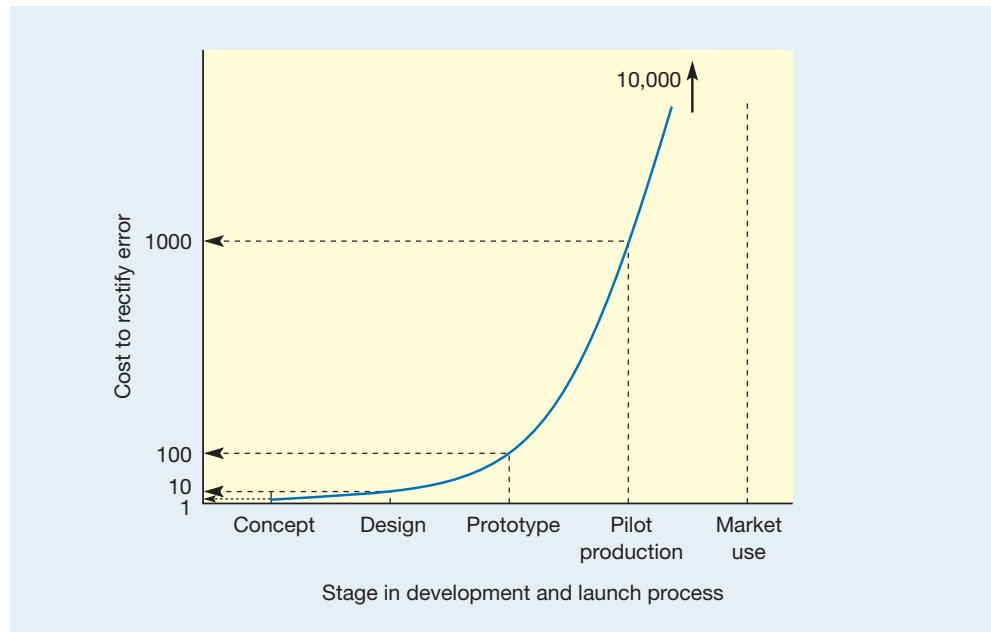
One of the most powerful aspects to emerge from TQM is the concept of the **internal customer** and **internal supplier**. This is recognition that everyone is a customer within the organization and consumes goods or services provided by other internal suppliers, and everyone is also an internal supplier of goods and services for other internal customers. The implication of this is that errors in the service provided within an organization will eventually affect the product or service which reaches the external customer. So, one of the best ways to ensure that external customers are satisfied is to establish the idea that every part of the organization contributes to external customer satisfaction by satisfying its own internal customers. TQM utilizes this concept by stressing that each process in an operation has a responsibility to manage these internal customer–supplier relationships. They do this primarily by defining as clearly as possible what their own and their customers' *requirements* are. In effect this means defining what constitutes 'error-free' service – the quality, speed, dependability and flexibility required by internal customers. The exercise replicates what should be going on for the whole operation and its external customers (see Figure 20.3). The short case 'Hewlett-Packard's internal customer checklist' gives one company's approach to the internal customer concept.

The internal customer concept is useful because it impacts on the 'upstream' parts of the internal supply network. For example, in manufacturing operations the product design department may make an error in the basic concept of a product. At this stage the error is relatively inexpensive to correct – maybe a little time re-researching or rethinking some issues will be required. If the error is not discovered until the detailed design stage, it can be as much as ten times more expensive to correct because of the many other decisions that will have been based on the original error. By the time of prototype manufacture, the cost of rethinking and recommissioning designs for the product could easily have escalated to 100 times what it would have been had the error been discovered at concept stage. By pilot production stage, investment in process technologies, job designs, marketing plans, etc. could be up to 1,000 times more expensive to change. Errors discovered in the market can be phenomenally expensive. The cost illustrated in Figure 20.4 of 10,000 times the original cost could even be an **underestimate**.

Errors become more costly the later they are detected



**Figure 20.3** The internal customer–supplier concept involves understanding the relationship between processes



**Figure 20.4** The cost of rectifying errors becomes increasingly expensive the longer the errors remain uncorrected in the development and launch process

## Short case Hewlett-Packard's internal customer checklist<sup>10</sup>



Hewlett-Packard, the information systems company, was one of the first to make a success of the internal-customer concept in its operations. One part of the way it used the concept was a short but effective checklist 'pocket guide' which was distributed throughout the company. It suggests each part of the organization should ask itself seven questions, which it regards as fundamental to the operation:

- Who are my customers?
- What do they need?
- What is my product or service?
- What are my customers' expectations and measures?
- Does my product or service meet their expectations?
- What is the process for providing my product or service?
- What action is required to improve the process?

H-P then went on to devise a problem-solving methodology, based on its seven questions, the stages for which are as follows:

- Select the quality issue.
- Write an issue statement.
- Identify the process.

- Draw a flow chart.
- Select a process performance measure.
- Conduct a cause-and-effect analysis.
- Collect and analyze the data.
- Identify the major causes of the quality issue.
- Plan for improvements.
- Take the corrective action.
- Collect and analyze the data again.
- Are the objectives met?
- If yes, document and standardize the changes.

### Questions

- 1 What do you see as the limitations of the set of questions which comprises Hewlett-Packard's internal customer checklist?
- 2 Do you think anything is missing from the problem-solving methodology described above?
- 3 What seems to be the implied problem-solving methodology described above? How does it compare with the Plan-Do-Check-Act (PDCA) process described in Chapter 18?

### Service-level agreements (SLAs)

Formal definitions of the dimensions and levels of service that should be provided by one process or operation to another.

### Service-level agreements

Some organizations bring a degree of formality to the internal customer concept by encouraging (or requiring) different parts of the operation to agree **service-level agreements (SLAs)** with each other. SLAs are formal definitions of the dimensions of service and the relationship between two parts of an organization. The type of issues which would be covered by such an agreement could include response times, the range of services, dependability of service supply and so on. Boundaries of responsibility and appropriate performance measures could also be agreed. For example, an SLA between an information systems support unit and a research unit in the laboratories of a large company could define such performance measures as:

- the types of information network services which may be provided as ‘standard’;
- the range of special information services which may be available at different periods of the day;
- the minimum ‘up time’, i.e. the proportion of time the system will be available at different periods of the day;
- the maximum response time and average response time to get the system fully operational should it fail;
- the maximum response time to provide ‘special’ services, and so on.

## Critical commentary

While some see the strength of SLAs as the degree of formality they bring to customer–supplier relationships, there are also some clear drawbacks. The first is that the ‘pseudo-contractual’ nature of the formal relationship can work against building partnerships (see Chapter 13). This is especially true if the SLA includes penalties for deviation from service standards. Indeed, the effect can sometimes be to inhibit rather than encourage joint improvement. The second and related problem is that SLAs, again because of their formal documented nature, tend to emphasize the ‘hard’ and measurable aspects of performance rather than the ‘softer’ but often more important aspects. So a telephone may be answered within four rings, but how the caller is treated, in terms of ‘friendliness’, may be far more important.

### Every person in the organization contributes to quality

#### Quality

There are many different approaches to defining this. We define it as consistent conformance to customers’ expectations.

TQM is sometimes referred to as ‘quality at source’. This notion stresses the impact that each individual staff member has on **quality**, as well as the idea that it is each person’s personal responsibility to get quality right. Some staff can affect quality directly. The staff who physically make products and the staff who serve customers face to face all have the capability to make mistakes which will be immediately obvious to customers (although the effects will be noticed much sooner in high customer contact service operations). Other staff who may be less directly involved in producing goods and services can also generate problems, however – the keyboard operator who mis-keys data or the product designer who fails to investigate thoroughly the conditions under which products will be used in practice. Any person could set in motion a chain of events which customers will eventually see as poor-quality products and services.

It follows then that if everyone has the ability to impair quality, they also have the ability to improve quality – if only by ‘not making mistakes’. It is partly because of this that TQM philosophies place considerable emphasis on the contribution which the individual staff of the organization can make to quality. In TQM, however, the contribution of all individuals in the organization is expected to go beyond understanding their contribution and a commitment to ‘not make mistakes’. Individuals are expected to bring something positive to the way they perform their jobs. Everyone is capable of improving the way in which they do their own jobs and practically everyone is capable of helping others in the organization to improve



theirs. Therefore, neglecting this potential in staff is neglecting a powerful source of improvement. The principles of ‘empowerment’ (see Chapter 9) are frequently cited as supporting this aspect of TQM, for example see the short case, ‘Improvement at Heineken – Part II’.

The shift in attitude which is needed to view employees as the most valuable intellectual and creative resource which the organization possesses can still prove difficult for some organizations. When TQM practices first began to migrate from Japan in the late 1970s, the ideas seemed even more radical. Some Japanese industrialists even thought (mistakenly) that companies in Western economies would never manage to change. Take, for example, a statement by Konosuke Matsushita which attracted considerable publicity:

*‘We are going to win and the industrial West is going to lose out – there is nothing much you can do about it because the reasons for your failure are within yourselves. For you, the essence of management is getting the ideas out of the heads of bosses into the hands of labour. For us, the core of management is precisely the art of mobilizing and pulling together the intellectual resources of all employees in the service of the firm. Only by drawing on the combined brain-power of all its employees can a firm face up to the turbulence and constraints of today’s environment. That is why our large companies give their employees three to four times more training than yours. This is why they foster within the firm such intensive exchange and communication. This is why they seek constantly everybody’s suggestions and why they demand from the educational system increasing numbers of graduates as well as bright and well-educated generalists, because these people are the lifeblood of industry.’<sup>11</sup>*

## Short case Improvement at Heineken – Part II<sup>12</sup>



The improvement approach of Heineken’s Zoeterwoude facility was described in Chapter 18. Although this description emphasized issues such as target setting and the use of techniques, of equal or more importance in making a success of the initiative was the way improvement teams were empowered, organized and motivated. In fact, before this improvement initiative, the company had started a ‘cultural change’ programme. ‘*Its aim*’, according to Wilbert Raaijmakers, the Brewery Director, ‘*was to move away from a command-and-control situation and evolve towards a more team-oriented organization.*’ Fundamental to this was a programme to improve the skills and knowledge of individual operators through special training programmes. Nevertheless, the improvement initiative exposed a number of challenges. For example, the improvement team discovered that it was easier to motivate people to work on improvements when the demand on the plant clearly exceeded its capacity. What was more difficult was to keep them focused when the pressures of keeping up production levels were lower, such as during the winter season. In an attempt to overcome this, communication was improved so that staff were kept fully informed of future production levels and the upcoming schedule of training and maintenance activities planned during slumps in demand. The lesson that the improvement team learned was that it is difficult to convince people of the necessity for change if they are not aware of the underlying reason for it.

Notwithstanding these efforts it soon became evident that some groups were more ready to make changes

than others. Some staff much preferred to stick with their traditional methods rather than explore how these could be improved. Similarly, some team leaders were more skilled at encouraging change than others. Many staff needed coaching and reassurance as well as more formal training on how to take ownership of problems and focus on achieving results in line with targets. Also, it was found that setting improvement targets in a step-by-step series of milestones could help to maintain the momentum of motivation.

During the improvement initiative, Heineken staff worked closely with a group of consultants (Celerant Consulting). Towards the end of the initiative, as is common in such improvement projects, the consultants gradually reduced their involvement to allow Heineken staff to take over control of the initiative. At this point there was a dip in the momentum of the improvement project. It needed the appointment of a special coordinator within the company to ‘monitor, secure and audit’ the various activities included in the project before it regained its momentum. Yet it did regain its momentum and looking back over the experience, Heineken sees one of the most significant outcomes from the initiative as its success in bringing home to every person in the company the realization that improvement is an on-going process.

### Question

- 1 What might explain the ‘slump’ in motivation for improvement during period of low demand and after the consultants stepped back from the initiative?

## Critical commentary

Be careful of what is meant by 'empowerment' in a TQM context. In many cases, it can be little more than an increase in employee discretion over minor details of their working practice. Some industrial relations academics argue that TQM rarely affects the fundamental imbalance between managerial control and employees' influence over organizational direction. For example:

*... there is little evidence that employee influence over corporate decisions which affect them has been, or can ever be, enhanced through contemporary configuration of involvement. In other words, whilst involvement might increase individual task discretion, or open up channels for communication, the involvement programme is not designed to offer opportunities for employees to gain or consolidate control over the broader environment in which their work is located.<sup>13</sup>*

### All costs of quality are considered

The costs of controlling quality may not be small, whether the responsibility lies with each individual or a dedicated quality control department. It is therefore necessary to examine all the costs and benefits associated with quality (in fact 'cost of quality' is usually taken to refer to both costs and benefits of quality). These costs of quality are usually categorized as *prevention costs*, *appraisal costs*, *internal failure costs* and *external failure costs*.

**Prevention costs** are those costs incurred in trying to prevent problems, failures and errors from occurring in the first place. They include such things as:

- identifying potential problems and putting the process right before poor quality occurs;
- designing and improving the design of products and services and processes to reduce quality problems;
- training and development of personnel in the best way to perform their jobs;
- process control through SPC.

**Appraisal costs** are those costs associated with controlling quality to check to see whether problems or errors have occurred during and after the creation of the product or service. They might include such things as:

- the setting up of statistical acceptance sampling plans;
- the time and effort required to inspect inputs, processes and outputs;
- obtaining processing inspection and test data;
- investigating quality problems and providing quality reports;
- conducting customer surveys and quality audits.

**Internal failure costs** are failure costs associated with errors which are dealt with inside the operation. These costs might include such things as:

- the cost of scrapped parts and material;
- reworked parts and materials;
- the lost production time as a result of coping with errors;
- lack of concentration due to time spent troubleshooting rather than improvement.

**External failure costs** are those which are associated with an error going out of the operation to a customer. These costs include such things as:

- loss of customer goodwill affecting future business;
- aggrieved customers who may take up time;
- litigation (or payments to avoid litigation);
- guarantee and warranty costs;
- the cost to the company of providing excessive capability (too much coffee in the pack or too much information to a client).

#### Prevention costs

Those costs that are incurred in trying to prevent quality problems and errors occurring, an element within quality related costs.

#### Appraisal costs

Those costs associated with checking, monitoring and controlling quality to see if problems or errors have occurred, an element within quality related costs.

#### Internal failure costs

The costs associated with errors and failures that are dealt with inside an operation but yet cause disruption; an element within quality related costs.

#### External failure costs

Those costs that are associated with an error or failure reaching a customer, an element within quality-related costs.

### The relationship between quality costs

In traditional quality management it was assumed that failure costs reduce as the money spent on appraisal and prevention increases. Furthermore, it was assumed that there is an *optimum* amount of quality effort to be applied in any situation, which minimizes the total costs of quality. The argument is that there must be a point beyond which diminishing returns set in – that is, the cost of improving quality gets larger than the benefits which it brings. Figure 20.5(a) sums up this idea. As quality effort is increased, the costs of providing the effort – through extra quality controllers, inspection procedures and so on – increases proportionally. At the same time, however, the cost of errors, faulty products and so on decreases because there are fewer of them. However, a ‘pure’ TQM approach would be to assert that this logic is flawed in a number of important respects:



- 1 It implies that failure and poor quality are acceptable. It recognizes that the ‘optimum’ point is one where there will be errors and failures. TQM challenges the whole concept of an ‘acceptable’ quality level. Why, it is argued, should any operation accept the *inevitability* of errors? Some occupations seem to be able to accept a zero-defect standard (even if they do not always achieve it). No one accepts that it is inevitable that pilots will crash a certain proportion of their aircraft or that nurses will drop a certain proportion of the babies they deliver.
- 2 It assumes that costs are known and measurable. In fact, putting realistic figures to the quality cost categories of prevention, appraisal and failure is not a straightforward matter.<sup>16</sup>
- 3 Failure costs in the traditional model are greatly underestimated. Although failure cost is taken to include the cost of ‘reworking’ defective products, ‘re-serving’ customers, scrapping parts and materials, the loss of goodwill and warranty costs, it should also include all the management time wasted in organizing rework and rectification. Even more important, it should take into account the loss of concentration and the erosion of confidence between parts of the operation.
- 4 It implies that prevention costs are inevitably high because it assumes that doubling the effort put into quality means doubling the resources devoted to it. By contrast, the TQM approach stresses that quality is an integral part of everyone’s work. Each of us has a responsibility for his or her own quality and is capable of ‘doing it right’. This may incur some costs – training, gauges, anything which helps to prevent errors occurring in the first place – but not such a steeply inclined cost curve as the traditional theory.
- 5 The ‘optimum-quality level’ approach, by accepting compromise, does little to challenge operations managers and staff to find ways of improving quality.

Put these corrections into the optimum-quality effort calculation and the picture looks very different (see Figure 20.5(b)). If there is an ‘optimum’, it is a lot further to the right, in the direction of putting more effort (but not necessarily cost) into quality.

### Short case **Deliberate defectives**

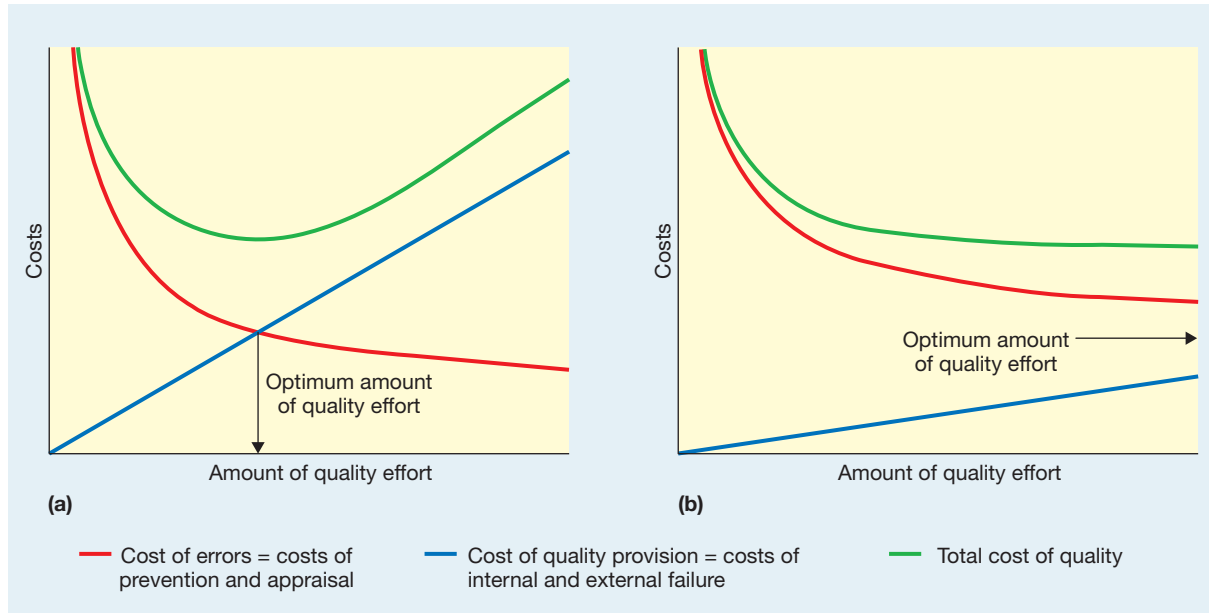


A story which illustrates the difference in attitude between a TQM and a non-TQM company has become almost a legend among TQM proponents. It concerns a plant in Ontario, Canada, of IBM, the computer company. It ordered a batch of components from a Japanese manufacturer and specified that the batch should have an acceptable quality level (AQL) of three defective parts per thousand. When the parts arrived in Ontario they were accompanied by a letter which expressed the supplier's

bewilderment at being asked to supply defective parts as well as good ones. The letter also explained that they had found it difficult to make parts which were defective, but had indeed managed it. These three defective parts per thousand had been included and were wrapped separately for the convenience of the customer.

#### Question

- 1 How does this short story illustrate the essence of TQM?



**Figure 20.5** (a) The traditional cost of quality model, and (b) the traditional cost of quality model with adjustments to reflect TQM criticisms

### The TQM quality cost model

TQM rejects the optimum-quality level concept and strives to reduce all known and unknown failure costs by preventing errors and failure taking place. Rather than looking for 'optimum' levels of quality effort, TQM stresses the relative balance between different types of quality cost. Of the four cost categories, two (costs of prevention and costs of appraisal) are open to managerial influence, while the other two (internal costs of failure and external costs of failure) show the consequences of changes in the first two. So, rather than placing most emphasis on appraisal (so that 'bad products and service don't get through to the customer'), TQM emphasizes prevention (to stop errors happening in the first place). That is because the more effort that is put into error prevention, the more internal and external failure costs are reduced. Then, once confidence has been firmly established, appraisal costs can be reduced. Eventually even prevention costs can be stepped down in absolute terms, though prevention remains a significant cost in relative terms. Figure 20.6 illustrates this idea. Initially total quality costs may rise as investment in some aspects of prevention – mainly training – is increased. However, a reduction in total costs can quickly follow.

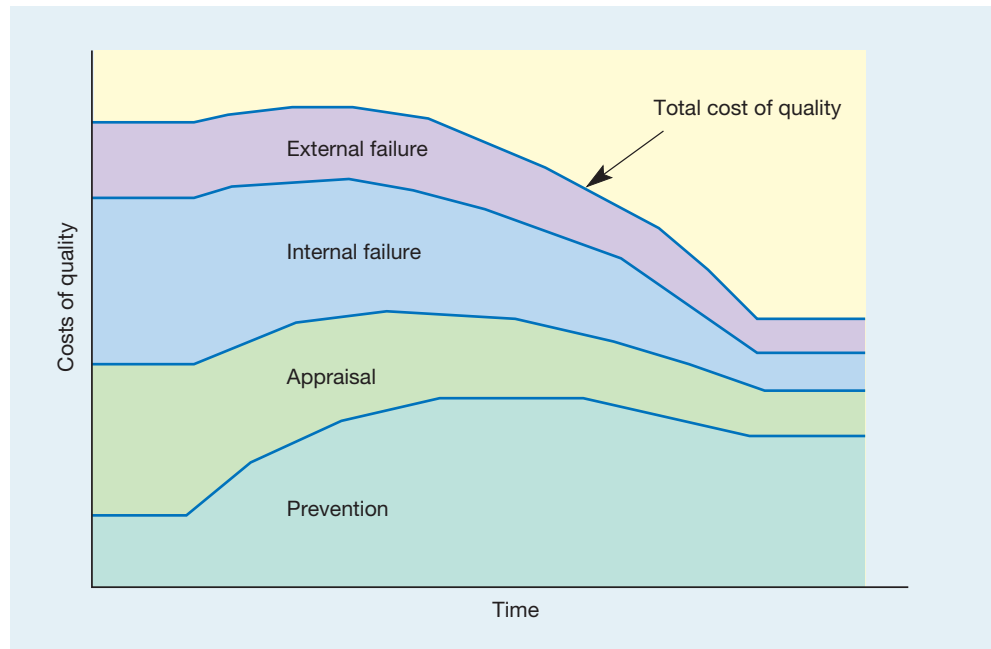
### Getting things 'right first time'

Accepting the relationships between categories of quality cost as illustrated in Figure 20.6 has a particularly important implication for how quality is managed. It shifts the emphasis from *reactive* (waiting for something to happen) to *proactive* (doing something before anything happens). This change in the view of quality costs has come about with a movement from an inspect-in (appraisal-driven) approach to a design-in (**getting it right first time**) approach.

Getting it right first time

### Quality systems and procedures

Improving quality is not something that happens simply by getting everyone in an organization to 'think quality'. Very often people are prevented from making improvements by the organization's systems and procedures. Indeed, there is a belief that direct operators can correct, at the most, only 15 per cent of quality problems; the other 85 per cent are management's responsibility because they are due to 'the system' or the lack of one.



**Figure 20.6** Increasing the effort spent on preventing errors occurring in the first place brings a more than equivalent reduction in other cost categories

A quality system is defined as:

*the organizational structure, responsibilities, procedures, processes and resources for implementing quality management.*<sup>14</sup>

According to Professor Barrie Dale of Manchester Business School:

*The quality system should define and cover all facets of an organization's operation, from identifying and meeting the needs and requirements of customers, design, planning, purchasing, manufacturing, packaging, storage, delivery and service, together with all relevant activities carried out within these functions. It deals with organization, responsibilities, procedures and processes. Put simply, a quality system is good management practice.*<sup>15</sup>

The documentation which is used in a quality system can be defined at three levels:

- Level 1** *Company quality manual.* This is the fundamental document and provides a concise summary of the quality management policy and quality system along with the company objectives and its organization.
- Level 2** *Procedures manual.* Describes the system functions, structure and responsibilities in each department.
- Level 3** *Work instructions, specifications and detailed methods for performing work activities.*

There can also be a database (level 4) which contains all other reference documents (forms, standards, drawings, reference information, etc.).

### The ISO 9000 approach

#### ISO 9000

A set of worldwide standards that established the requirements for companies quality management systems, last revised in 2000, there are several sets of standards.

The **ISO 9000** series is a set of worldwide standards that establishes requirements for companies' quality management systems. ISO 9000 is being used worldwide to provide a framework for quality assurance. Many countries have their own quality system standards which are equivalent (usually identical) to the ISO 9000 series. By 2000, ISO 9000 had been adopted by more than 250,000 organizations in 143 countries. ISO 9000 registration requires

a third-party assessment of a company's quality standards and procedures and regular audits are made to ensure that the systems do not deteriorate. Its purpose when it was first framed in 1994 was to provide an assurance to the purchasers of products or services that they have been produced in such a way that they meet their requirements. The best way to do this, it was argued, was to define the procedures, standards and characteristics of the management control system which governs the operation. Such a system would help to ensure that quality was 'built into' the operation's transformation processes.

In 2000 ISO 9000 was substantially revised. Rather than using different standards for different functions within a business it took a 'process' approach that focused on outputs from any operation's process rather than the details procedures that had dominated the previous version of ISO 9000. This process orientation requires operations to define and record core processes and sub-processes (in a manner very similar to the 'hierarchy of processes' principle that was outlined in Chapter 1). In addition, processes are documented using the process mapping approach that was described in Chapter 4. Also, ISO 9000 (2000) stresses four other principles.

- Quality management should be customer focused. Customer satisfaction should be measured through surveys and focus groups and improvement against customer standards should be documented.
- Quality performance should be measured. In particular, measures should relate both to processes that create products and services and customer satisfaction with those products and services. Furthermore, measured data should be analyzed in order to understand processes.
- Quality management should be improvement driven. Improvement must be demonstrated in both process performance and customer satisfaction.
- Top management must demonstrate their commitment to maintaining and continually improving management systems. This commitment should include communicating the importance of meeting customer and other requirements, establishing a quality policy and quality objectives, conducting management reviews to ensure the adherence to quality policies, and ensuring the availability of the necessary resources to maintain quality systems.

The ISO 9000 (2000) family of quality standards is, in fact, four separate standards.

ISO 9000 – Quality Management Systems: Fundamental and Vocabulary.

ISO 9001 – Quality Management Systems: Requirements.

ISO 9004 – Quality Management Systems: Guidance for Performance Improvement.

ISO 19011 – Guidelines for Auditing Quality and Environmental Management Systems.

ISO 9000 (2000) is seen as providing benefits both to the organizations adopting it (because it gives them detailed guidance on how to design their control procedures) and especially to customers (who have the assurance of knowing that the products and services they purchase are produced by an operation working to a defined standard). The following are just some of the advantages that are claimed:

- Many operations find it provides a useful discipline to stick to 'sensible' process-oriented procedures.
- Many operations have benefited in terms of error reduction, reduced customer complaints and reduced costs of quality.
- The ISO 9000 audit (when an organization is inspected to see whether it warrants the award of the ISO, or local country, accreditation) is generally accepted and takes the place of other audits such as customer audits.
- Adopting ISO 9000 procedures can identify existing procedures which are not necessary and can be eliminated.
- Gaining the certificate demonstrates to actual and potential customers that the company takes quality seriously; it therefore has a marketing benefit.

## Critical commentary

Notwithstanding its widespread adoption (and its revision to take into account some of its perceived failings), ISO 9000 is not seen as beneficial by all authorities and is still subject to some specific criticisms. These include the following:

- The continued use of standards and procedures encourages ‘management by manual’ and over-systematized decision making.
- The whole process of documenting processes, writing procedures, training staff and conducting internal audits is expensive and time-consuming.
- Similarly, the time and cost of achieving and maintaining ISO 9000 registration are excessive.
- It is too formulaic. It encourages operations to substitute a ‘recipe’ for a more customized and creative approach to managing operations improvement.

## Implementing improvement programmes

Not all of the improvement initiatives which organizations launch, often with high expectations, will go on to fulfil their potential of having a major impact on performance improvement. *The Economist* magazine, reporting on some companies’ disillusionment with their experiences, quoted from several surveys.<sup>16</sup> For example:

*‘Of 500 US manufacturing and service companies, only a third felt their total quality programmes had significant impact on their competitiveness.’*

*‘Only a fifth of the 100 British firms surveyed believed their quality programmes had achieved tangible results.’*

*‘Of those quality programmes that have been in place for more than two years, two thirds simply grind to a halt because of their failure to produce hoped-for results.’*

There are two broad types of failure which affect implementation – either the initiative is not introduced and implemented effectively, and/or after the initiative has been introduced successfully its effectiveness fades over time.

### TQM implementation

A number of factors appears to influence the eventual success of performance improvement programmes such as TQM. These are as follows.



Source: RHM Ltd

Total quality management programmes must encourage the contribution of everyone in the organization even when jobs are routine and mechanically paced

### A quality strategy

Without thinking through the overall purpose and long-term goals of a TQM programme it is difficult for any organization to know where it is going. A quality strategy is necessary to provide the goals and guidelines which help to keep the TQM programme heading in a direction which is appropriate for the organization's other strategic aims. Specifically, the quality strategy should have something to say about the competitive priorities of the organization, the roles and quality responsibilities of all parts of the organization, the resources available for quality improvement and the quality philosophy of the organization.

### Top-management support

**Top-management support** The importance of **top-management support** goes far beyond the allocation of resources to the programme; it sets the priorities for the whole organization. If the organization's senior managers do not understand and show commitment to the programme, it is only understandable that others will ask why they should do so. Table 20.1 illustrates one study showing the importance of top-management support. Usually this is taken to mean that top management must:

- understand and believe in the benefits of 'doing things right';
- communicate the principles and techniques of quality management;
- participate in the total problem-solving process to eliminate errors;
- formulate and maintain a clear idea of what quality means for the organization.

### A steering group

The task of a steering group is to plan the implementation of the programme. This involves planning the overall direction of the programme in terms of what it should achieve as it gathers pace. It also involves deciding where to start the programme and who initially to involve. Further, the group is responsible for monitoring the programme and making sure that all the learning and experience, accumulated as the programme progresses, is not lost. It could be argued that a steering group also has a second task – to make sure that even if it does not work itself totally out of a job, its role diminishes over time. This can be achieved by establishing self-supporting improvement groups.

### Group-based improvement

No one can really know a process quite like the people who operate it. The staff who work in the operation are often the ones who know best how things really work. They have access to the informal as well as the formal information networks. However, working as individuals, staff cannot pool their experience or learn from one another. This is why successful TQM programmes are almost always based on teams; the nature and composition of the team will depend on the circumstances. *Quality circles* are much used in Japan but have encountered mixed success in the West. A very different type of team is the '*task force*'. Compared with quality circles, this type of group is far more management directed and focused. Most quality improvement teams are between these two extremes.

**Table 20.1** Quality barriers ranked in order of 'very significant' replies<sup>17</sup>

Top-management commitment	92%
Too narrow an understanding of quality	38%
Horizontal boundaries: functions and specialisms	31%
Vested interests	29%
Organizational politics	28%
Cynicism	28%
Organizational structure	27%
Customer expectations	26%
Speed of corporate action	24%



### Success is recognized

Any TQM implementation needs to consider how it should respond to the efforts of the improvement teams. If quality improvement is so important, then success should be marked in some way. Recognizing success formally stresses the importance of the quality improvement process as well as rewarding effort and initiative. Participating in the development process itself (a part of their job which most managers take for granted) is also sometimes seen as rewarding by many in the organization.

### Training is the heart of quality improvement

It is no coincidence that so many successful programmes have a training manager as one of their prime movers. TQM is, partly at least, an attitudinal change, so the development task is fundamental to it. There are techniques for staff to learn as well, of course, but the purpose of the techniques is solely to work towards the basic objective – the elimination of errors.

## Short case Six Sigma at Xchanging – Part II<sup>18</sup>



In Chapter 17 the business process outsourcing company Xchanging was described together with its use of Six Sigma improvement tools. The company also adopts the Six Sigma approach to managing its improvement projects, including the terminology for its improvement practitioners – Master Black Belts, Black Belts and Green Belts. Attaining the status of Black Belt is very much sought after as well as being fulfilling, say Rebecca Whittaker who is a Master Black Belt at Xchanging. *'At the end of a project it is about having a process which is redesigned to such an extent that it is simplified and consolidated and people come back and say, "It's so much better than it used to be". It makes their lives better and it makes the business results better and those are the things that make being a Black Belt worthwhile.'*

Rebecca was recruited by Xchanging along with a number of other Master Black Belts as part of a strategic decision to kick-start Six Sigma in the company. It is seen as a particularly responsible position by the company and Master Black Belts are expected to be well versed in the Six Sigma techniques and able to provide the training and know how to develop other staff within the company. In Rebecca's case she has been working as a Six Sigma facilitator for five years, initially as a Green Belt, then as a Black Belt.

Typically, a person identified as having the right analytical and interpersonal skills will be taken off their job for at least a year, trained and immersed in the concepts of improvement and then sent to work with line staff as project manager/facilitator. Their role as Black Belt will be to guide the line staff to make improvements in the way they do the job. One of the new Black Belts at

Xchanging, Sarah Frost, is keen to stress the responsibility she owes to the people who will have to work in the improvement process. *'Being a Black Belt is about being a project manager. It is about working with the staff and combining our skills in facilitation and our knowledge of the Six Sigma process with their knowledge of the business. You always have to remember that you will go onto another project but they (process staff) will have to live with the new process. It is about building solutions that they can believe in.'*

Prior to becoming a fully trained Black Belt, Sarah had been involved with Six Sigma projects as a Green Belt. *'I was working as part of a project team under the direction of Rebecca and I enjoyed the whole experience so much I thought, hey, I fancy doing that, so I asked if I could be trained up to be Black Belt myself. The move has been even better than I thought it would be. Since becoming a Black Belt I really do feel that I have contributed to improving the performance of individual processes and, through that, the company as a whole. Working full time as a Black Belt allows you to build your knowledge of the improvement process over a wide variety of projects. It lets you reach a new level of understanding that you can't get when you are only spending part of your time on improvement.'*

### Question

- 1 What are the benefits and problems of training Black Belts and taking them off their present job to run the improvement projects rather than the project being run by a member of the team with responsibility for actually operating the process?

**Six Sigma**

An approach to improvement and quality management that originated in the Motorola Company but which was widely popularized by its adoption in the GE Company in America. Although based on traditional statistical process control, it is now a far broader 'philosophy of improvement' that recommends a particular approach to measuring, improving and managing quality and operations performance generally.

**Master Black Belt****Black Belt****Green Belt**

## The Six Sigma approach to organizing improvement

The **Six Sigma** approach that was described in Chapter 17 holds that improvement initiatives can be successful only if significant resources and training are devoted to their management. It recommends a specially trained cadre of practitioners, many of whom should be dedicated full time to improving processes as internal consultants. The terms that have become associated with this group of experts (and denote their level of expertise) are Master Black Belt, Black Belt and Green Belt.

**Master Black Belt** – Master Black Belts are experts in the use of Six Sigma tools and techniques as well as how such techniques can be used and implemented. Primarily Master Black Belts are seen as teachers who can not only guide improvement projects but also coach and mentor Black Belts and Green Belts who are closer to the day-to-day improvement activity. They are expected to have the quantitative analytical skills to help with Six Sigma techniques and also the organizational and interpersonal skills to teach and mentor. Given their responsibilities, it is expected that Master Black Belts are employed full time on their improvement activities.

**Black Belt** – Black Belts can take a direct hand in organizing improvement teams. Usually a Black Belt will have undertaken a minimum of 20–25 days training and carried out at least one major improvement project over a 3–6-month training period. Like Master Black Belts, Black Belts are expected to develop their quantitative analytical skills and also act as coaches for Green Belt. Again, like Master Black Belts, Black Belts are dedicated full time to improvement, and although opinions vary on how many Black Belts should be employed in an operation, some organizations recommend one Black Belt for every 100 employees.

**Green Belt** – Green Belts work within improvement teams, possibly as team leaders. They have significant amounts of training, although less than Black Belts, typically around 10–15 days of training. Unlike Black Belts, Green Belts are not full-time positions. They have normal day-to-day process responsibilities but are expected to spend at least 20 per cent of their time on improvement projects.

## Critical commentary

The criticism of the Six Sigma approach to organizing improvement is that it can be too hierarchical in the way it structures its various levels of involvement in the improvement activity (as well as the dubious use of martial arts-derived names such as Black Belt). It is also expensive. Devoting such a large amount of training and time to improvement is a significant investment, especially for small companies. Nevertheless, Six Sigma proponents argue that the improvement activity is generally neglected in most operations and if it is to be taken seriously, it deserves the significant investment implied by the Six Sigma approach. Furthermore, they argue, if operated well, Six Sigma improvement projects run by experienced practitioners can save far more than their cost.

## TQM loses its effectiveness

**Quality disillusionment**

Even TQM programmes which are successfully implemented are not necessarily guaranteed to continue to bring long-term improvement. They may lose their impetus over time. This phenomenon has been variously described as **quality disillusionment** and *quality droop*.<sup>19</sup> Figure 20.7 illustrates this loss of effectiveness. Various researchers and consultants who have experienced quality disillusionment have put forward prescriptions which are intended to reduce the risk of it occurring. Typically, these prescriptions include the following:<sup>20</sup>



- Do not define 'quality' in TQM narrowly; it includes all aspects of performance (what we have called the performance objectives of operations management).
- Make all quality improvement relate to the performance objectives of the operation. TQM is not an end in itself; it is a means of improving performance.

- TQM is not a substitute for the responsibilities of normal managerial leadership. Ineffective managers are not made better simply by adopting TQM.
- TQM is not a ‘bolt-on’ attachment to the company – an activity which is separate from the other activities of the organization. It should be integrated with and indistinguishable from everyday activities.
- Avoid the hype. TQM has a considerable intuitive attraction for many. It is sometimes tempting to exploit the motivational ‘pull’ of TQM through slogans and exhortations rather than thoroughly thought-out plans.
- Adapt TQM to the circumstances of the organization. Different organizations will have different needs depending on their circumstances. This means that different aspects of TQM might become more or less important.

## Critical commentary

Some companies and academics see far more fundamental flaws in the TQM philosophy than are implied by the list of implementation issues described above. The first set of criticisms is centred on the ‘quality bureaucracy’ which many firms find they need to manage a large-scale TQM initiative. Some companies which were in the vanguard of the TQM movement, such as Hewlett-Packard, admit that at one time they pushed quality for its own sake and have shifted too much responsibility down to the shop floor. The second criticism is that TQM is incompatible with more radical improvement approaches such as business process re-engineering (BPR, see Chapter 18). Note that one of Deming’s original 14 points (see the beginning of the chapter) concerned ‘driving out fear’. In other words, staff security is important to the acceptance of change. Yet radical BPR is often accompanied by equally radical ‘downsizing’ of the organization. It is difficult to reconcile such job losses with the job security necessary for true TQM. The third criticism is that TQM, notwithstanding its implications of empowerment and liberal attitude towards shop-floor staff, is merely a further example of management exploiting workers. By its critics, TQM has been defined as ‘management by stress’. Or, even more radically, ‘TQM is like putting a vacuum cleaner next to a worker’s brain and sucking out ideas. They don’t want to rent your knowledge any more, they want to own it – in the end that makes you totally replaceable.’

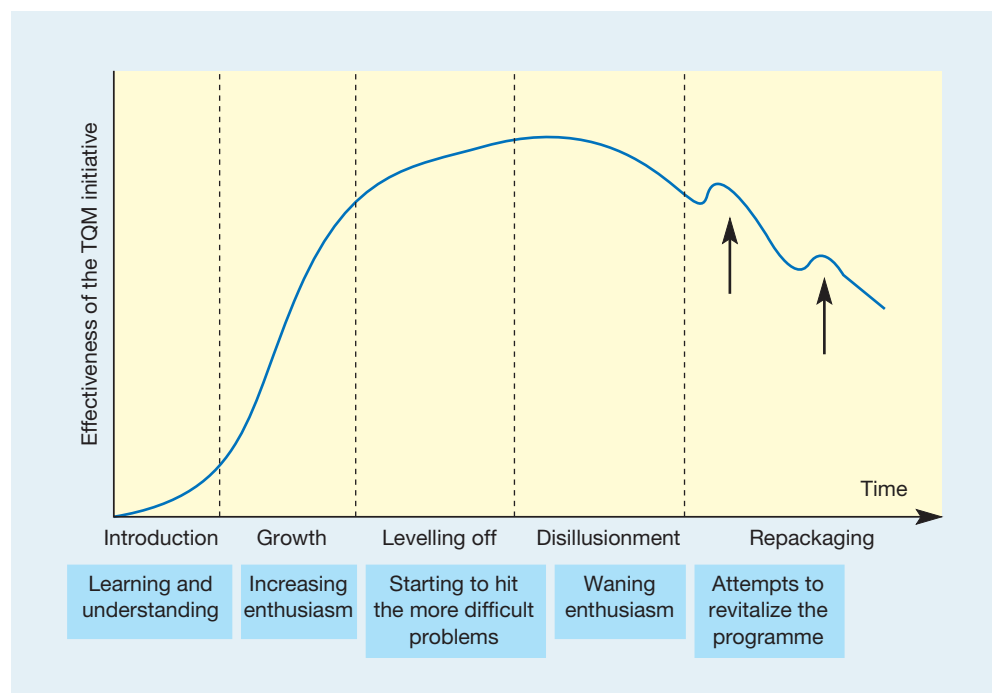


Figure 20.7 The pattern of some TQM programmes which run out of enthusiasm

## Quality awards

### Deming Prize

### Malcolm Baldrige National Quality Award

### European Quality Award (EQA)

A quality award organized by the European Foundation for Quality Management (EFQM), it is based on the EFQM excellence model.

TQM has been recognized as an important integrator of many aspects of operations improvement, to the extent that various bodies have sought to stimulate quality improvement through establishing quality awards. The three best-known awards are the **Deming Prize**, the **Malcolm Baldrige National Quality Award** and the **European Quality Award (EQA)**.

### The Deming Prize

The Deming Prize was instituted by the Union of Japanese Scientists and Engineers in 1951 and is awarded to those companies, initially in Japan but more recently opened to overseas companies, which have successfully applied 'company-wide quality control' based upon statistical quality control. There are ten major assessment categories: policy and objectives, organization and its operation, education and its extension, assembling and disseminating of information, analysis, standardization, control, quality assurance, effects and future plans. The applicants are required to submit a detailed description of quality practices. This is a significant activity in itself and some companies claim a great deal of benefit from having done so.

### The Malcolm Baldrige National Quality Award

In the early 1980s the American Productivity and Quality Center recommended that an annual prize, similar to the Deming Prize, should be awarded in America. The purpose of the awards was to stimulate US companies to improve quality and productivity, to recognize achievements, to establish criteria for a wider quality effort and to provide guidance on quality improvement. The main examination categories are leadership, information and analysis, strategic quality planning, human resource utilization, quality assurance of products and services, quality results and customer satisfaction. The process, like that of the Deming Prize, includes a detailed application and site visits.

### The EFQM Excellence Model



In 1988, 14 leading Western European companies formed the European Foundation for Quality Management (EFQM). An important objective of the EFQM is to recognize quality achievement. Because of this, it launched the European Quality Award (EQA), awarded



A European Quality Award certificate

### EFQM Excellence Model or Business Excellence Model

A model that identifies the categories of activity that supposedly ensure high levels of quality; now used by many companies to examine their own quality-related procedures.

to the most successful exponent of total quality management in Europe each year. To receive a prize, companies must demonstrate that their approach to total quality management has contributed significantly to satisfying the expectations of customers, employees and others with an interest in the company for the past few years. In 1999, the model on which the European Quality Award was based was modified and renamed the **EFQM Excellence Model or Business Excellence Model**. The changes made were not fundamental but did attempt to reflect some new areas of management and quality thinking (for example, partnerships and innovation) and placed more emphasis on customer and market focus. It is based on the idea that the outcomes of quality management in terms of what it calls ‘people results’, ‘customer results’, ‘society results’ and ‘key performance results’ are achieved through a number of ‘enablers’. These enablers are leadership and constancy of purpose, policy and strategy, how the organization develops its people, partnerships and resources, and the way it organizes its processes. These ideas are incorporated in the EFQM Excellence Model as shown in Figure 20.8. The five enablers are concerned with how results are being achieved, while the four ‘results’ are concerned with what the company has achieved and is achieving.

### Self-assessment

#### Self-assessment

The EFQM defines **self-assessment** as ‘a comprehensive, systematic, and regular review of an organization’s activities and results referenced against a model of business excellence’, in its case the model shown in Figure 20.8. The main advantage of using such models for self-assessment seems to be that companies find it easier to understand some of the more philosophical concepts of TQM when they are translated into specific areas, questions and percentages. Self-assessment also allows organizations to measure their progress in changing their organization and in achieving the benefits of TQM. An important aspect of self-assessment is an organization’s ability to judge the relative importance of the assessment categories to its own circumstances. The EFQM Excellence Model originally placed emphasis on a generic set of weighting for each of its nine categories. With the increasing importance of self-assessment, the EFQM moved to encourage organizations using its model to allocate their own weightings in a rational and systematic manner.

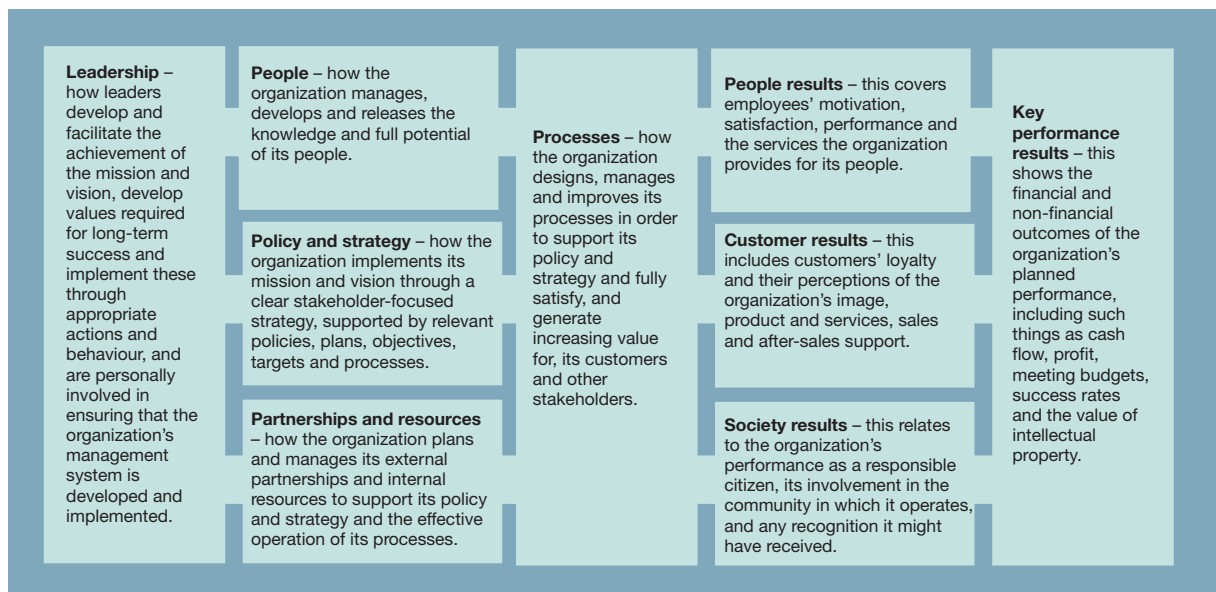


Figure 20.8 The EFQM Excellence Model

## Summary answers to key questions



The Companion Website to the book – [www.pearsoned.co.uk/slack](http://www.pearsoned.co.uk/slack) – also has a brief ‘Study Guide’ to each chapter.

### Where did the idea of total quality management (TQM) come from?

- The term was first formally used in 1957 by Feigenbaum. Many authorities have contributed to the development of the idea, however. These authorities include Feigenbaum, Deming, Juran, Ishikawa, Taguchi and Crosby. The emphasis placed on various aspects of TQM varies among these authorities but the general thrust of their arguments is similar.
- TQM can be seen as being an extension of the traditional approach to quality – inspection-based quality control being replaced by the concept of quality assurance which in turn has been superseded by TQM.

### What are the main differences between traditional quality management and TQM?

- TQM puts customers at the forefront of quality decision making. Customers’ needs and expectations are always considered first in measuring achieved quality.
- TQM takes an organization-wide perspective. It holds that all parts of the organization have the potential to make a positive contribution to quality. Central to this idea is the concept of the internal customer–supplier chain.
- TQM places emphasis on the role and responsibilities of every member of staff within an organization to influence quality. It encourages the idea of empowering individuals to improve their own part of the operation.
- Traditionally, the emphasis was placed on finding an optimum amount of quality effort which minimized the costs associated with quality. By contrast, TQM emphasizes the balance between different types of quality cost. It argues that increasing the expenditure and effort on prevention will give a more-than-equivalent reduction in other costs. This idea is often summarized in the phrase ‘right first time’.

### What is the role of ISO 9000 in TQM?

- ISO 9000 and its associated family of standards are concerned with the processes and procedures that support quality. These are intended to assure purchasers of products and services that they have been produced in a way which meets customer requirements.
- ISO 9000 was adapted in 2000 to answer the criticism of being over-bureaucratic and inflexible.

### What are the main implementation issues in TQM initiatives?

- A number of factors appear to be influential in ensuring the success of TQM, such as the existence of a fully worked-out quality strategy, top-management’s support, a steering group to guide the initiative and group-based improvements.

### How do quality awards and models contribute towards TQM?

- By providing a focused structure for organizations to assess their own quality management and improvement efforts.
- A number of organizations have attempted to encourage TQM by the awarding of prizes and certificates. The best known of these is probably the EFQM (Business) Excellence Model. This is based on a nine-point model which distinguishes between the ‘enablers’ of quality and the ‘results’ of quality. It is often now used as a self-certification model.

## Case study

### The Waterlander Hotel<sup>21</sup>



The previous evening's banquet for Plastix International had been a complete disaster and Walter Hollestelle, the hotel General Manager, was still recovering from the series of telephone conversations of that morning.

First, with the Vice-President of Global Marketing, Plastix International Plc: *'I had hoped that by having our annual sales conference at your renowned hotel in Amsterdam, we would be treated to an even better level of service than last year, when we were at Rotterdam; but we were to be deeply disappointed. After all the problems you have caused us over the last two days, from faulty video projection to shortages of cups at coffee breaks, I had hoped that at least the final conference dinner would run smoothly, but you let us down badly. The cocktail reception was a farce: the choice of non-alcoholic drinks that we specially ordered didn't appear until the last minute, and as the president's wife is teetotal, you can imagine the embarrassment that caused! A spilt tray of snacks was not cleared up quickly and several guests got food all over their shoes and dresses. And why did the reception drag on for so long?*

*'When we were finally asked into the dining room, it clearly wasn't properly prepared. Some of the tables (including ours) were without flowers, which upset my wife, who had been involved with the selection of arrangements. Even the flowers that were there were the wrong variety and looked as if they had been on the tables since yesterday.*

*'The meal was the worst I have ever seen! I never expect banquet food to be as good as à la carte, but this was awful! The starter was dried up and chewy and the sweet soufflés were flat and rubbery. And we couldn't believe that anyone could mess up a simple entrée. We were served the cutlets and potatoes, but the sauce and vegetables didn't appear until I'd nearly finished mine.*

*'And what happened to the microphones on the top table? The photographer didn't turn up either, which is perhaps a blessing as the tables weren't cleared completely after the sweet and I'm sure that everyone would have looked in a bad mood after all the mess-up! I can tell you straight – we won't be paying all your exorbitant charges for this banquet and I expect a written apology for all the upset we have been caused. The president must think I am an idiot to have chosen this hotel, and I think he has a point.'*

Next, with the Manager of Aalsmeer Electronics: *'I was told that the public address system had to be set up by 7.00 pm. We often do jobs of this type and two hours is more than enough, so we allowed an extra half-hour and started at 4.30 pm. Your staff wouldn't let us get to the tables to wire them and we had to wait until they cleared them off for us.'*



Source: Corbis/Richard T. Nowitz

Then, with his own Hotel Services Manager: *'It has always been agreed that we must wait until the cutlery has been laid before we set out the flowers and yesterday we simply weren't given enough time to see to all the tables. As for the types of flowers, we were never told that the client wanted red and pink arrangements. I would have recommended other colours anyway, as reds would not look good against the dining room decor. Unfortunately, the electricians moved our arrangements out of the way against a heating outlet, so by the time we got to them, the flowers looked a bit beyond their best condition. I suppose that's what happens if you allow contractors to interfere with our operation.'*

And, with the Conference Manager: *'We were never told that the client wanted to use the video equipment, which was scheduled for repairs next weekend. Had I known, we could have hired in another projector, but we never got the conference checklist back from the client. If we had got that, it would also have indicated that there were an extra ten delegates here just for the morning to make some sort of presentation to the conference. These problems are all down to the client: if they don't follow our system, it's their fault if things go wrong.'*

From the Head Chef: *'I always get a detailed schedule from the head waiter. I get the fish, the sauces, the vegetables and the desserts ready according to that schedule – if things run as late as they did last night, you can expect a few problems. Cooking is an art. All the chefs know how to cook to perfection every time, but if we can't serve the food when it's ready, it will be messed up. I can tell you that if you think the customer was angry, you should have come into the kitchen. Some of the conference delegates were rude to the waiters, who came back into the kitchen and told the chefs. All the staff were really upset and*



*Pierre, our sauce chef, refused to start on the cutlet sauce until the fish course was cleared.'*

From the Head Waiter: *'We weren't told that the electricians would have to wire the tables. They worked setting up the loudspeakers and amplifiers while we were setting the tablecloths and laying the place settings. Their foreman then told us that the tables would have to be cleared for them, so you can imagine the problems that caused. I think we did very well to put everything right in under half an hour.'*

Finally, with the photographer: *'We were booked for 10.00 pm and the Conference Manager told us that, according to the customer, we would only be needed for half an*

*hour during the speeches. When we arrived they were still in the middle of the meal and so I waited a bit, but we had another booking at the Concert Hall at the end of a performance at 11.00 pm, so I had to rush off. If we'd known earlier I could have arranged for a partner to come along.'*

### Questions

- 1 Why did things go wrong at the banquet?
- 2 How could a TQM approach to the hotel's operations help to prevent such disasters occurring in the future?
- 3 How could ISO 9000 help the hotel?



Other short cases and worked answers are included in the Companion Website to this book – [www.pearsoned.co.uk/slack](http://www.pearsoned.co.uk/slack)

## Problems

- 1 Reread the 'Operations in practice' piece at the beginning of the chapter on 'Taxing quality' which describes the improvement initiative carried out by the Aarhus Region customs and tax unit.
  - (a) How does the idea of a customer-focused approach to improvement need to be adapted for a customs and tax unit?
  - (b) Generally, how might the ideas of improvement organization outlined in this chapter need to be adapted for public sector operations such as this one?
- 2 *'I can't say that this was our finest hour! The total bill for the product recall was over \$4 million and if you count the cost to our reputation, it was probably even higher. Even before that the whole project was in trouble. After the design modifications we were left with a brand new robotic handling device that was inappropriate. That cost over \$200,000. Add to that another \$150,000 for other modifications to the production process and you can see the impact of leaving it late to make design changes. Recommissioning the market research during the final design stage cost \$30,000. It makes the budget overrun on the actual design activity of \$2000 look quite respectable. In fact, the original design engineers seem to be the only people who have kept within budget.'*
  - (a) Are these quality-related costs related in any way?
  - (b) Do you think the speaker is right in implying that the designers are the only ones to come out of this with any credit?
- 3 What are the differences and similarities between the approach taken by the Aarhus customs and tax unit and the example described in the short case on 'Improvement at Heineken'?
- 4 Electro-connect is a manufacturer of specialist computer system cables and interface devices. Three years ago it started an improvement initiative that placed a significant emphasis on 'quality right first time'. This shifted the focus of its design, production and distribution functions towards quality improvement teams. The following table (page 673) shows some budget items that relate to quality-related costs four years ago, before the initiative started, and this year, three years after the initiative started.
  - (a) How would you classify these budget items into the four categories of quality-related costs (appraisal, prevention, internal failure, external failure)?
  - (b) In what way have the absolute costs and the proportion of spend changed? Is this as you would expect?



Budget item	Before (four years ago)		After (now)				
	Amount	Budget item	Amount	Budget item	Amount	Budget item	Amount
Replacement costs	€120,000	Legal representation	€50,000	Replacement costs	€69,000	Legal representation	€19,000
Scrap	€12,000	Incoming inspection	€60,000	Scrap	€9,500	Incoming inspection	€12,000
Inspection equipment	€78,000	Design for production project	0	Inspection equipment	€36,000	Design for production project	€40,000
Operator training	€9,000	Quality teams	0	Operator training	€26,000	Quality teams	€30,000
Process control stats packages	€35,000	Quality related downtime	€68,000	Process control stats packages	€68,000	Quality related downtime	€13,000
Customer complaint handling	€90,000	Inspector training	€70,000	Customer complaint handling	€70,000	Inspector training	0

- 5** Compare and contrast the approaches taken by Xchanging described in the short case and that taken by Heineken, also described in the short case.
- 6** Ruggo Carpets encourages continuous improvement based around the 'drive for customer focus'. The company's total quality process has graduated from 'total customer satisfaction' to 'total customer delight' to its present form – 'bridging the gap' – which is effectively a 'where we are' and 'where we should be' yardstick for the company. Developments in the warehouse are typical. The supervisor has been replaced by a group leader who acts as a 'facilitator', working within the team. He is trained to carry out his own job, plus five others. Fixed hours are a thing of the past, as is overtime. At peak times the team works the required hours to dispatch orders, and at off-peak times, when work is completed, the team can leave. Dispatch labels and address labels are computer-generated and the carpets are bar coded to reduce human error. Each process within the warehouse has been analysed and re-engineered.
- (a) What is implied by the progression of the company's three initiatives from 'total customer satisfaction' to 'total customer delight' to 'bridging the gap'?
- (b) Evaluate this example against the criteria included in the Business Excellence Model.

## Study activities



Some study activities can be answered by reading the chapter. Others will require some general knowledge of business activity and some might require an element of investigation. All have hints on how they can be answered on the Companion Website for this book that also contains more discussion questions – [www.pearsoned.co.uk/slack](http://www.pearsoned.co.uk/slack)

- 1** Using the four categories of quality-related costs discussed in this chapter, make a list of the costs that fall within each category for the following operations.
- (a) A university library.
- (b) A washing machine manufacturer.
- (c) A nuclear electricity-generating station.
- (d) A church.



- 2** Consider how a service level agreement could be devised for the following:
- The service between a library and its general customers.
  - The service given by a motor vehicle rescue service to its customers.
  - The service given by a university audio visual aids department to both academic staff and students.
- 3** Using an internet search engine (such as Google.com), look at the consultancy organizations that are selling help and advice on:
- total quality management, and
  - Six Sigma.
- How do the TQM and Six Sigma 'products'; appear to be sold to prospective customers?
- 4** Visit the website of the European Foundation for Quality Management ([www.efqm.org](http://www.efqm.org)).
- Look at the companies that have won or been finalists in the European Quality Awards and try to identify the characteristics which make them 'excellent' in the opinion of the EFQM.
  - Investigate how the EFQM promotes its model for self-assessment purposes.

## Notes on chapter

- Source: The EFQM website, [www.efqm.org](http://www.efqm.org).
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- Source: Rees, J. and Rigby, P. (1988) 'Total Quality Control – The Hewlett-Packard Way', in Chase, R.L. (ed.) (1988) *Total Quality Management*, IFS.
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- Quoted in Smith, S., Tranfield, D., Foster, M. and Whittle, S. (1994) 'Strategies for Managing the TQ Agenda', *International Journal of Operations and Production Management*, Vol. 14, No. 1.
- Binney, G. (1992) 'Making Quality Work: Lessons from Europe's Leading Companies', The Economist Intelligence Unit, *Special Report*, No. P655.
- Source: discussions with company staff.
- Slack, N. (1991) *The Manufacturing Advantage*, Mercury Business Books.
- Slack, N., *ibid.*
- Based on an idea originally used by Professor Keith Lockyer.

## Selected further reading

- Bounds, G., Yorks, L., Adams, M. and Ranney, G.** (1994) *Beyond Total Quality Management: Towards the Emerging Paradigm*, McGraw-Hill. A useful summary of the state of play in total quality management at about the time it was starting to lose its status as the only approach to managing quality.
- Dale, B.G.** (ed.) (2003) *Managing Quality*, Blackwell. This is the latest version of a long-established, comprehensive and authoritative text.
- Deming, W.E.** (1986) *Out of the Crisis*, MIT Press. One of the gurus. It had a huge impact in its day. Read it if you want to know what all the fuss was about.
- Feigenbaum, A.V.** (1986) *Total Quality Control*, McGraw-Hill. A more comprehensive book than those by some of the other quality gurus.
- George, M.L., Rowlands, D. and Kastle, B.** (2003) *What Is Lean Six Sigma?*, McGraw-Hill. Very much a quick introduction on what Lean Six Sigma is and how to use it.

## Useful websites

- <http://www.quality-foundation.co.uk/> The British Quality Foundation is a not-for-profit organisation promoting business excellence.
- <http://www.juran.com> The Juran Institute's mission statement is to provide clients with the concepts, methods and guidance for attaining leadership in quality.
- <http://www.asq.org/> The American Society for Quality site. Good professional insights.
- <http://www.quality.nist.gov/> American Quality Assurance Institute. Well-established institution for all types of business quality assurance.
- <http://www.gslis.utexas.edu/~rpollock/tqm.html> Non-commercial site on total quality management with some good links.
- <http://www.iso.org/iso/en/ISOOnline.frontpage> Site of the International Organisation for Standardisation that runs the ISO 9000 and ISO 14000 families of standards. ISO 9000 has become an international reference for quality management requirements.
- [www.opsman.org](http://www.opsman.org) Definitions, links and opinion on operations management.