Chapter 9

Joseph M. Juran

. . . the vital few, the useful many . . .
(Joseph M. Juran)

KEY LEARNING POINTS

Joseph Juran's definition of quality: fitness for use or purpose.

Key beliefs: management responsibility; planning; measurability; training, process.

Principal methods: company-wide quality control; the quality planning road map; the ten steps to quality improvement.

INTRODUCTION

Joseph Juran is a naturalized American. He commenced his initial career as an engineer in 1924, subsequently working as an executive, civil servant, academic, arbitrator, director and management consultant. This strong professional background supported his first work in the quality field, the *Quality Control Handbook*, which is seen by some, for example Bendell (1989: 8), as having led to his international pre-eminence in the field of quality. Like Deming, Juran worked extensively with the Japanese in the 1950s, where the focus of his work was with middle- and high-ranking executives since he considers that 'quality control should be conducted as an integral part of management control' (Juran, 1974).

He has received numerous awards for his work, including, again like Deming, the Second Order of the Sacred Treasure by the emperor of Japan in recognition of his contribution to Japanese quality control and friendship with the United States.

Juran is described by Bendell (1989) as charismatic, by Bank (1992: 70) as 'perhaps the top quality guru', and by Logothetis (1992: 62) as having made 'the greatest contribution to the management literature of any quality professional'. Juran has published twelve

books, which have been translated into thirteen languages. Perhaps the most relevant of these is *Juran on Planning for Quality* (1988). This may be seen as the definitive guide to his thinking on company-wide quality planning.

9.1 PHILOSOPHY

Juran's philosophy is perhaps best summed up in the saying, quoted by Logothetis (1992: 62), 'Quality does not happen by accident, it has to be planned.' This is reflected in his structured approach to company-wide quality planning, an aspect already met in the work of other gurus, for example Ishikawa and Feigenbaum. He is considered by Logothetis (1992) and Bendell (1989: 8) to emphasize management's responsibility for quality, with Bendell (ibid.: 10) quoting him as saying that 'management controllable defects account for over 80 per cent of the total quality problems'. The emphasis of his work is on 'planning, organizational issues, management's responsibility for quality and the need to set goals and targets for improvement' (ibid.: 8). Juran's first two beliefs can be derived from this: first that management are largely responsible for quality; second, that quality cannot be consistently improved unless the improvement is planned.

Logothetis (1992: 64) considers another aspect to Juran's work: the avoidance of slogans and exhortations. He cites Juran's view that 'the recipe for action should consist of 90% substance and 10% exhortation, not the reverse!'. Here can be seen Juran's third belief, that planned improvement must be specific and measurable. Logothetis sees in this aspect a 'formula for results' which consists of four elements:

- Establish specific goals to be reached – identify what needs to be done, the specific projects that need to be tackled.
- Establish plans for reaching the goals; provide a structured process for going from here to there.
- Assign clear responsibility for meeting the goals.
- Base the rewards on results achieved – feed back the information and utilize the lessons learned and the experience gained.

This approach indicates a clear reliance on quantitative methods, rather than any mere vague or woolly-minded aspirations to higher quality – what Flood (1993: 19) refers to as Juran's concern that 'Quality has become too gimmicky, full of platitudes and supposed good intentions, but short on real substance.'

Juran's definition of quality constitutes another strand of his philosophy. He defines quality as 'fitness for use or purpose' (Bank, 1992: 71). Bank suggests that this is a more useful definition than 'conformance to specification', since a dangerous product could conform to all specifications but still be unfit for use. It may be compared with Crosby's definition of 'conformance to requirements'. It would probably be reasonable to assume that safety in use would be a requirement for Crosby – although he does not say so!

The final important strand to Juran's thinking is in his 'trilogy' of quality planning, quality control and quality improvement (Box 9.1). This essentially simple formulation encapsulates the demand for substantial action inherent in all Juran's work. Juran's emphasis in this respect

Box 9.1 *Joseph Juran's 'quality trilogy'*

Quality planning	Determine quality goals Institute implementation planning Institute resource planning Express goals in quality terms Create the quality plan
Quality control	Monitor performance Compare objectives with achievements Act to reduce the gap
Quality improvement	Reduce waste Enhance logistics Improve employee morale Improve profitability Satisfy customers

is in three areas: changing management behaviour through quality awareness; training; and then spilling down new attitudes to supporting management levels. This top-down approach reflects Juran's belief that management is largely responsible for quality problems.

To summarize Juran's philosophy, five key beliefs can be identified:

- Management are largely responsible for quality.
- Quality can be only improved through planning.
- Plans and objectives must be specific and measurable.
- Training is essential and starts at the top.
- A three-step process of planning, control and action is needed.

9.2 ASSUMPTIONS

The assumptions about the world which seem to underpin Juran's approach are discussed below.

The first point to be examined is the assumption by Juran, along with Deming, that there is a quality crisis. It is certainly the case that consumers' expectations of products and services have increased and there is a lower tolerance of faults than was once the case. We all expect our watches to keep time, our cars to start every day and that services will be provided reliably and consistently.

There are at least three potential views of the quality problem. First, it could be argued that the quality gurus 'created' the quality crisis by raising awareness of the quality issue, focusing attention on the negative aspects and driving up consumer expectations, which in turn has forced producers and providers to improve. A second argument is that awareness of the costs of poor quality among providers and producers increased, leading managements to focus their attention on improving quality, which then became a virtue for their product (and bottom line!). A third view is that consumers have driven the quality movement through increasing expectations and an unwillingness to tolerate defective or shoddy goods and services.

VIGNETTE 9.1 FLETCHER CHALLENGE STEEL, CHINA: PLANNING AND POLITICS

In 1995, Fletcher Challenge Steel formed a joint venture with Datong City Government in China – Fletcher Challenge Steel, China – to upgrade the Datong iron-making plant and build a new melt shop to melt and cast steel billets. The team from Fletcher Challenge had created a plan for the venture involving increases in both volume and quality of output and reductions in manning levels, together with a significant investment in new equipment. The overall aim was to achieve levels of performance comparable to those of Western mills. Fletcher Challenge had previously undertaken best practice studies and was successfully implementing performance improvements in its domestic steel operations in New Zealand.

Following the formation of the joint venture company, a management team was appointed, composed of some of the established local Chinese managers, the project team from New Zealand, and selected new appointees with Chinese origins but Western technical education and knowledge. It was recognized right from the outset that cultural barriers to success would exist and that effective communication would be vital. In part, this communication was seen to rest on common language and shared cultural background.

In 1997, well behind the planned timescale, the plant began to approach the levels of output performance necessary to be self-supporting in the long run and to justify the substantial investment made in it by Fletcher Challenge. The initial financial investment consisted of US$25 million, but this was supported by a substantial investment of personal credibility by the Fletcher Steel chief executive, Mike Smith. Smith, an Englishman, had persuaded the group board of Fletcher Challenge to make the investment, and despite his success in the New Zealand plants, could not afford to have this venture fail.

The delays in achieving the planned performance improvements did not result from poor technical planning but from an inadequate appreciation of the political difficulties and resistance that would be met from the Chinese partners. The local managers were suddenly faced with both technical and managerial challenges to the ways in which they had been accustomed to run their business. Such challenges alone are often sufficient to inhibit any change programme. When those challenges are reinforced by cultural and language differences between the parties, then significant problems are almost inevitable. Equally, the plans were externally derived. The local established management were not involved in the planning process; rather, the results of that process were presented to them, a factor which would further inhibit their acceptance – particularly when the standards of performance proposed were considered unachievable as they were outside the scope of local experience. These factors combined to generate significant internal resistance to the implementation of the plans and, without the commitment of the local senior management, workforce acceptance was also inhibited.

This story emphasizes that quality is not just a technical issue and that success in designing and implementing a quality programme really does depend on the whole-hearted commitment and active participation of all those involved in or affected by the programme. It can never be enough to cajole and persuade either managers or workers to support the programme. A mechanism must be found which enables genuine participation and genuine commitment from all parties.

The truth probably lies in a combination of all of these arguments, with interrelationships between the factors being the driving force. This moves the quality argument away from the linear view of the world, seen in the work of Crosby and Ishikawa, towards a more holistic approach.

Looking at wider issues, it can certainly be argued that in the world of relatively mature consumer markets, which is clearly evident not just in Europe and North America but also in parts of the Pacific region, and further industrialization in less economically developed nations, the substantial growth in availability of goods and services must lead to a focus on performance. Thus poor quality represents a major threat to organizational survival. Achievement of quality becomes not an ideal to aim for but, like profit, a fundamental requirement for staying in business.

To argue that there was a 'quality crisis' implies a decline in quality. It is more likely that there was an increase in expectations. As has often been said, 'If we can put a man on the moon, why can't we make a toaster that works?'

A second assumption is that management of the organization and of quality are both processes. This idea has considerable appeal. Management is often thought of as a set of discrete activities, but this view is rather narrow and simplistic. To recognize that management is a process, with all actions and decisions interacting with all others, is a much broader and perhaps more realistic view. There can be little argument with Juran in this respect, especially as much current thinking in management revolves around the ideas of organizing ventures on process lines and on 're-engineering' those processes.

A third assumption is of the potential for continuous improvement. This has already been addressed in the chapters on Deming and Ishikawa. To reiterate briefly, continuous improvement is a reasonable aspiration in a continuous world. However, when change outside the organization becomes discontinuous, then continuous improvement may lose its value. Discontinuity in the environment probably demands discontinuity in the organization.

The fourth and final assumption to be examined is that relating to quantification. Juran's work focuses very clearly on measurement and specific objectives. Again, as with other gurus, the validity of this approach must be questioned. Many aspects of quality, particularly in the service sector, are difficult to quantify accurately and reliably. Significantly, some aspects are outside the control of the organization providing the service. This leads to two problems. The first is the tendency to measure those aspects which are easily accessible, rather than those which are most important. The second is how to measure individual customer expectations, expectations which may vary each time the service is purchased. The normal route here is to provide a standard service and educate customers to understand what they can expect. A different, and rather more difficult route, is to adapt the service to meet individual expectations.

There is a clear bias in the use of quantitative methods, which can be considered to arise for Juran in the industrial/manufacturing basis of the greater part of his work. This perhaps limits to some extent the application of his ideas in the service sector.

9.3 METHODS

While Juran's 'quality trilogy' of planning, control, improvement offers the guideline to his approach, his overarching methodology for achieving quality is the 'quality planning road map'

(Bendell, 1989: 9). Recognizing both external and internal customers, the 'road map' (Box 9.2) offers a nine-step guide. These steps will be briefly reviewed in turn.

The first two steps refer not just to external customers but also to the customers of processes within the organization. The process of identifying the customers and determining their needs is normally seen as identifying the single next step in the process, although it might be thought that a more useful view is to identify the whole chain and all the interrelationships. It could be the case that a particular feature of a product is of no significance to the immediate customer but has enormous impact for one at a later stage of the process. It is therefore important to recognize and take account of the requirements of all possible customers in the chain.

The third step is really about effective communication. A package of requirements that is expressed in a language unknown or unfamiliar to the people in the organization will be of no help. Obvious examples of this are converting words in general or common usage – the customer's language – into the specific technical jargon of the organization. Less obvious are internal requirements. Here it is important that the requirements are expressed in terms meaningful to the working group involved. For example, a condition expressed in the language of accounting to meet a particular budget in terms of profit and loss may be meaningless to a group of engineers. It is essential that their 'budget' be expressed in relevant terms such as required throughput, machine utilization or levels of waste.

Developing a product that responds to customer needs takes the quality issue back to its most fundamental aspect: building quality in rather than inspecting defects out. This is one aspect where other gurus agree. It is better and cheaper to establish quality from the outset than to engage in rectification. Optimizing the product to meet the organization's or department's needs as well as those of the customer should ideally be seen as a constraint on the development process of the previous step rather than as a separate issue. It is, or should be, a design constraint that the product meets these requirements simultaneously.

The development, optimization and testing of a production process, making it operational, is an area that historically has received little attention. Consulting experience has shown that often, products have been developed by the research and development staff of a company, then

Box 9.2 *Joseph Juran's quality planning road map*

Step 1	Identify who are the customers
Step 2	Determine the needs of those customers
Step 3	Translate those needs into our language [the language of the organization]
Step 4	Develop a product that can respond to those needs
Step 5	Optimize the product features so as to meet our [the company's] needs as well as customers' needs
Step 6	Develop a process which is able to produce the product
Step 7	Optimize the process
Step 8	Prove that the process can produce the product under operating conditions
Step 9	Transfer the process to operations

simply handed over to the production staff with the instruction to make them. More recently, many companies are taking account of manufacturing requirements in the development process. Ease of manufacture is becoming accepted as a design constraint.

The final point is to transfer the process to operations. Again, historically this has been done very badly, and there is no argument with Juran's proposal. A useful device to assist with this aspect, and something which is being adopted by many companies, is to create teams for product development which include operational staff and managers. If the idea of designing for manufacture is adopted, then this step becomes very straightforward.

Supporting this fundamental approach to designing quality into the systems and processes is what Bank (1992: 70) refers to as Juran's 'ten steps' to continuous quality improvement (Box 9.3). Here it can be seen how Juran's philosophy is carried across into practice. The first step begins to establish a quality-oriented culture in the organization through the process of raising awareness of the need and scope – a qualitative approach. The second is quantitative: establishing objectives – goals – for improvement. The third step is an attempt to institutionalize quality, to embed the quality process in the management process so that it becomes an ingrained part of the organization.

The fourth step takes the organization forward to train the entire staff. This is seen as helping to make quality an integral part of everyone's thinking.

The fifth and sixth steps, 'carry out projects' and 'report progress', recognize that while continuous improvement is the objective, it must be achieved within visible and measurable elements. The reporting process is seen as enabling experience and learning to be shared and to allow those involved to share their sense of achievement. This also allows the seventh step, 'show recognition', to be actioned. The sixth and eighth steps are linked, 'communicate results' being a call to share the successes (and failures) throughout the organization.

The ninth step, keeping a record, is again an aid to organizational learning. A record may be thought of as an organizational 'memory' to which reference can be made in the future. While Juran suggests that this record should be of successes, it is arguably just as important

Box 9.3 *Joseph Juran's ten steps to continuous quality improvement*

Step 1	Create awareness of the need and opportunity for quality improvement
Step 2	Set goals for continuous improvement
Step 3	Build an organization to achieve goals by establishing a quality council, identifying problems, selecting a project, appointing teams and choosing facilitators
Step 4	Give everyone training
Step 5	Carry out projects to solve problems
Step 6	Report progress
Step 7	Show recognition
Step 8	Communicate results
Step 9	Keep a record of successes
Step 10	Incorporate annual improvements into the company's regular systems and processes and thereby maintain momentum

to memorize strategies and schemes that do not work as to remember those that do. This may enable the organization to avoid or encourage those forms of behaviour in the future. Most important of all – for both success and failure – is to understand why changes have succeeded or failed. To be able to distil the general principles of success from a specific instance or series of instances is to create a true basis for organizational learning, After all, the specific instance will never arise again, but the principles underpinning the solved problem will almost certainly recur many times, and the practice of problem solving is enhanced by understanding at the general rather than the particular level.

The tenth step is a corporate-level and public commitment to the achievement of higher quality. This should be seen as reaffirming the quality process in the minds of both employees and customers.

Juran shows awareness of the phenomenon of resistance to change, which is so common in organizations. Logothetis (1992: 75) reports Juran's belief that 'resistance to a technological change is due to social and cultural factors'. Juran proposes two principal methods for dealing with this. First, he considers that all those affected by the change should be 'allowed to participate'(ibid.). Second, he specifies that 'adequate time should be allowed for the change to be accepted'. These approaches are seen as providing an opportunity for evaluation and experimentation, promoting ownership of the changes and helping to overcome resistance.

To underpin the two processes outlined above – 'the road map' and the 'ten steps' – Juran uses a variety of statistical methods. Like Deming, Juran studied under Shewhart and so relies on many of the same approaches, for example control charts. Perhaps one of the best known of his approaches is using Pareto analysis to help separate the 'vital few' problems from the 'useful many'.

9.4 SUCCESSES AND FAILURES

It must be accepted that Juran, like the other gurus, has been hugely successful in developing and promoting his ideas. That his books have been translated into thirteen languages and his ideas accepted and exploited by so many organizations and in so many different countries is a measure of the perceived value of his contribution. However, his work has not been applied universally and can be seen to be less effective in the service sector than in manufacturing.

According to Flood (1993: 21–22), the strengths of Juran's approach are:

- its concentration on genuine issues of management practice;
- the new understanding of the customer that it offers, referring to both internal and external customers.
- its stress on management involvement and commitment.

The main weaknesses are perceived as the following:

- The literature on motivation and leadership is not addressed.
- Workers' contributions are underrated.
- Methods are traditional, failing to address culture and politics.

Another criticism is that the body of systems knowledge, and in particular managerial and organizational cybernetics, which could have enhanced and enriched Juran's approach, has, like human relations theory, been largely ignored.

The first strength that Flood identified, concentration on genuine management issues, is one with which most people would agree, although a programme which fails to motivate and develop the majority of the workforce is one which may well be seen as consisting merely of hype.

The second strength, that of recognizing other parts of the organization as customers, is again welcome. Readers will recall that this can also be found in the work of Deming and is now embedded in the ISO 9000:2000 standard as well as in other quality management system standards.

The third strength is management commitment and involvement. This is not simply because, by Juran's measure, 80 per cent of the total quality problem resides there, but also because the power, control and leadership reside there. A management which is seen by the workforce to be committed to quality will 'breed' a quality ethos for the organization. Workers wishing to progress and be content within a quality-oriented environment will probably emulate the behaviour and attitudes of their managers. If this occurs, then the quality ethos will tend to spill down through the organization over time.

Turning to the weaknesses, Flood's understanding that Juran fails adequately to incorporate theories of motivation and leadership is generally accepted. However, Juran is a practitioner; he deals best with the practice of quality, rather than the theory. It might be suggested that the second statement of weakness, that Juran undervalues the contribution of the worker, is countered to some extent by the explicit incorporation of participation.

Flood further suggests that Juran emphasizes a somewhat 'mechanistic' view of the organization, although acknowledging that he does take account of the organization's environment – that is, of its markets. The view is largely evident in the unstated assumption that what is good for the organization – higher quality – is also good for the individual. This perhaps reflects the thinking of the early management theorists such as Taylor, Weber and Fayol. In the contemporary world of 'knowledge workers', high-technology equipment and increasing emphasis on human rights, quite often what is good for the organization may appear to be bad for the workers. This applies to both the short- and long-term views. A company operating in the face of maturing or mature markets and not positioned to exploit emerging markets, with fresh, lower-cost-base competitors from newly industrializing countries, may be unable to absorb spare capacity through growth. This leads to the need, to use the politically correct terminology, to 'retrench' workers.

The interests of the organization and the individual worker may come into direct conflict. The organization wishes to improve quality to preserve and protect its customer base, to reduce its costs and ensure its survival. The workers may recognize that these same attributes can have different consequences for them – for example, job losses, pay freezes, reductions in overtime, or loss of other benefits. Often they can lead to the deskilling of jobs and the loss of craft skills in which individuals take great, and justifiable, pride. There is little incentive for the workforce to contribute to the quality programme if a successful outcome for the company threatens their own – short-term – sense of security. They may well seek to preserve their position in the short term while accepting the inevitable longer-term threat. Events in France

and Germany during 1997 perhaps give this point extra emphasis. Compared with the United Kingdom, organizations in those nations had undertaken little by way of radical change and restructuring. Despite the emergent threat to jobs in those economies arising from high costs, questionable productivity and overseas competition, the workers, as represented by the unions, were strongly resisting change. The appeal for participation must deal with issues of this type if it is to have any hope of success. Juran offers little in this regard.

9.5 CRITICAL REVIEW

The founding idea of Juran's work might almost be called 'design and build'. His approach stresses planning as the fundamental requirement for quality, followed by action. This orientation towards the setting and achievement of objectives perhaps reflects Juran's engineering and statistical background.

The 'quality trilogy', the 'quality road map' and the 'ten steps to quality' (Boxes 9.1, 9.2 and 9.3 respectively) may all be considered systematic, somewhat mechanistic, approaches. While Juran established a new understanding of customers (the internal and external), he does not explicitly recognize the importance of the interdependence of processes and the interactions between people within the organization. This prevents his systematic approach from becoming systemic. Juran seems to be making the assumption that improvement in the individual parts will necessarily improve the whole organization, a view which is challenged by the systems thinking community.

With regard to management, two issues should be stressed. First, Juran views management as a process. Second, he sees management as responsible for quality, having control of 80 per cent of the problems. As regards the first of these, Juran's view is to be welcomed. An organization which recognizes that every action and decision is inextricably linked with every other in a continuous process of management must be considered to be on the verge of a breakthrough in its behaviour. Even today, management in many organizations is fragmented into pseudo-independent functions: marketing is separate from finance, which is in turn separate from production, and so on. Each of these units attempts to maximize its own function independently from the others. Similarly, even within departments, tasks are often seen as independent, rather than interdependent. For example, recruitment is often seen as a separate function, to be kept within the personnel or human resource function and having no relationship with training and development – and, crucially, no relationship with the units where those recruited will work. In this sort of organization, it is not surprising that there are conflicts, disputes and difficulties in matching people to tasks. A more holistic, integrated and interdependent 'process' view is essential. While Juran moves towards this approach, he perhaps does not go far enough.

Concerning the second issue, management responsibility, perhaps the question that should be asked is, why 80 per cent? Deming, for example, has provided statistics suggesting that the figure is 94 per cent, while Crosby's work may be interpreted as suggesting that the bulk of the responsibility lies with the workers. An argument can be proposed whereby management take complete responsibility for quality. If, as Fayol (1916) suggests, it is the responsibility of management to 'Plan, Organise, Command, Control and Co-ordinate', then responsibility should lie with them. The argument is this: management is expected to have control of every aspect of the organization:

- what is done;
- how it is done;
- when it is done;
- where it is done;
- who does it;
- why it is done.

This suggests that there should be no matter internal to the organization which is beyond the scope of management to address. Random errors in production, for example, might be eradicable through changes in design or process so that it becomes impossible to assemble a part incorrectly. Human error might be eradicable through training, adjustment of work rates, increases (or reductions!) in relaxation time or a range of other variables which could be altered to enable improved performance.

It is suggested that the ultimate responsibility for quality should rest with all those who are involved in the production of a good or a service – that is, every employee within every part and function of the organization. However, the power to achieve higher quality rests in the hands of those who have authority (power) to change things. If that power is in the hands of the management alone, then they have full responsibility. If, on the other hand, the power is shared throughout the organization, perhaps through empowerment initiatives, quality circles and other participative approaches, then everyone who shares in that power is responsible.

The strong emphasis by Juran on management responsibility fails to address adequately the needs and aspirations of workers. He does not properly take into account the contribution that they can make to the achievement of quality, nor does he provide mechanisms through which they can contribute.

Finally, the issue must again be raised of the applicability of Juran's work. It seems to be most suitable for the industrial and manufacturing sectors. It is suggested that it has limited application in service organizations since it does not adequately deal with human issues.

SUMMARY

This chapter has reviewed the major contribution made to the quality movement by Juran. Students should refer to Joseph M. Juran's (1988) own work to further inform and develop their views.

QUESTION

Juran defines quality as 'fitness for use or purpose'. Define 'fitness for use or purpose' in the context of the products or services of your organization. Consider your answer in terms of customers, owners, workers, suppliers and the surrounding community.