

In association with:



The European Centre For Total Quality Management

International Journal of Applied Quality Management

Volume 2 Issue 2 Special Edition

**TQM Critical Factors:
The Recipe for Successful Implementation**

**TQM: Theoretical Insights
Part 1**

Dr. A. Al Nofal
Research Associate

Dr. N. Al Omair
Research Associate

Prof. M. Zairi
European Centre for TQM

ISSN 1742-2647

Abstract

The objective of this paper is to provide an overview of the literature on TQM. The literature review tries to cover a complete framing for various matters. The focus is mainly on the fundamentals of TQM with special stress on what are described as the essentials of TQM. The paper is presented in three parts: firstly, it discusses the development of TQM, with the ideas of changing definitions; secondly, it looks at various models of TQM and the quality gurus, stressing the evolution of the concept; and finally, it concludes by synthesizing the information in the literature into a coherent framework in an attempt to portray the key principles and components of TQM. **Part 1** specifically presents a theoretical understanding on the origins and definitions of TQM, the work of the gurus and models proposed by gurus, experts and consultant.

Key Words: Total Quality Management, Deming, Juran, Crosby, Critical Factors, Leadership

Development of TQM

The evolution and development of TQM from a historical perspective can be examined. For example, Martinez-Lorente et al. (1998) have listed all the important events in the development of TQM from the 1924 to 1987. In the past eight decades, the concept of TQM has undergone many changes (Nwabueze, 2001). For example, in 1950, Juran produced the first edition of the produced *Quality Control Handbook*. After ten years, Feigenbaum produced the first edition of *Total Quality Control* in 1961. In the mid-1970s, quality circles began to be widely introduced in the USA. Crosby's *Quality is free* was produced in 1979. Then Deming's *Out of the Crisis* became the bestseller in 1985. The publication of the Malcolm Baldrige National Quality Award started in 1987. All these give us a clear picture of the development of TQM. Before we start discussing the contribution of the quality gurus, let's first examine the definition of the term TQM (Leitner, 1999) and Table 1 presents details.

Table 1: Important events in development of TQM

Table III Important events in the development of TQM	
1924-1932	Hawthorne studies demonstrated the importance of the social and psychological climate in work.
1924	Shewhart developed statistical process control.
1926	The Bell Telephone began to apply statistical control methods.
Mid-1940s	The American army pushed the use of sampling methods during World War II.
1950s	A large number of attempts at work improvement were undertaken (e.g. job enrichment, work redesign, participative management, quality of work life and worker involvement).
1950	First visit of Deming to Japan.
1951	Creation of "Deming Application Prize" in Japan. First edition of Juran's <i>Quality Control Handbook</i> .
1954	First visit of Juran to Japan. Maslow's theories about human needs.
1960	Liberalisation of economy in Japan with pressure to improve quality to compete with foreign companies. McGregor's X and Y theories.
1961	First edition of Feigenbaum's <i>Total Quality Control</i> .
1962	The idea of quality circles appeared in the first issue of the Japanese journal <i>Quality Control for the Foreman</i> .
Late 1960s and early 1970s	
1970s	The pressure of Japanese companies began to be felt in American companies.
1972	QFD was developed at Mitsubishi's Kobe shipyard site.
1973	After the 1973 oil crisis the JIT system was adopted by a vast number of Japanese companies. A small number of American and European companies began to apply this system in the 1980s.
Mid-1970s	Quality circles began to be widely introduced in the USA, the first quality circle programme was launched in Lockheed in 1974 and in the UK it was Rolls-Royce which introduced the concept in 1979.
1979	First edition of Crosby's <i>Quality Is Free</i> . Xerox Corp. started to apply the benchmarking concept to processes. Publication of the BS 5750 quality management series.
1980	An NBC television documentary about the "Japanese miracle" proposed Deming as a key element in this miracle.
1981	Ouchi's Z theory.
1982	First edition of Deming's <i>Quality, Productivity and Competitive Position</i> .
1983	"Quality on the line", published by Garvin in <i>Harvard Business Review</i> , analysed the differences between Japanese and American companies, showing some of the reasons for the better performance of the former. A paper about Taguchi's design of experiments is published in <i>Harvard Business Review</i> .
1985	The Naval Air Systems Command named its Japanese-style management approach "total quality management".
1986	First edition of Deming's <i>Out of the Crisis</i> . It became a bestseller.
1987	First edition of ISO 9000 quality management system series.
1987	Publication of the Malcolm Baldrige National Quality Award.

Source: Based on Martinez-Lorente et al. (1998)

Conceptualisation of Quality

The concept of “quality” is subjective, meaning different things to different people. This leads to different definitions, none of which is universally accepted, despite considerable attention in the literature. One important point to note is that quality is a multidimensional concept. The definition of quality depends largely on the orientation of the individual involved. As Reeves and Bednar, (1994) point out, no single definition of quality fits every situation with respect to measurement, generalizability, usefulness to management, and relevance to customers. Garvin (1984, 1987) describes the multidimensional nature of quality by defining a system of five bases and eight dimensions. The five bases are: -

1. transcendental,
2. product,
3. user,
4. manufacturing,
5. value.

The eight dimensions are:-

1. performance,
2. features,
3. reliability,
4. conformance,
5. durability,
6. serviceability,
7. aesthetically,
8. perceived quality.

In addition to these manufacturing based dimensions, Parasuraman, et al. (1988) identified a further set of dimensions as:

1. tangibility,
2. reliability,
3. responsiveness,
4. assurance,
5. empathy.

Some definitions of quality include:

- Something with the positive attribute of conformance to specified standards. Conformance to requirements (Crosby 1979);
- A predictable degree of uniformity and dependability at a low cost with a quality suited to the market (Deming 1986);
- Anything which can be improved.
- Avoidance of loss a product causes to society after being shipped other than any losses caused by its intrinsic function (Taguchi1986);
- Product performance which results in customer satisfaction "fitness for use"(Juran 1988);
- Total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product in use will meet the expectation of the customers.

All these definitions place satisfaction of customers' needs and wants at the centre of the concept of quality. Recently, quality has acquired a broader meaning to embrace the satisfaction of both the internal and external customer (Dean and Bowen 1994).

Definition of TQM

The literature on TQM reveals that while there is general agreement on the importance of quality management and on the broad basis in which it should be managed, there is no such consensus on what quality management actually means (Gehani, 1993; Dobyys and Crawford, 1991). Hill and Wilkinson (1995) argue that TQM is a 'notoriously imprecise term'. They indicated a number of reasons for this. First, the original quality management "gurus" have been long on prescription but short on analysis, and moreover, have differed amongst themselves. Second, is that practitioners tend to use the term to describe a very wide range of practices. Third, is that the intellectual origins and part of the theoretical basis of TQM derived from the application of statistics to production management, are in contrast to most other contributions to management theory, which derive from one of the social sciences and have different applications (Grant et al., 1994).

Hill and Wilkinson (1995) made further important contributions to the debate about the definition of TQM. One is that quality gurus have been disinclined '... to refer to previous management literature or indeed to reference much outside the quality management field'. Also, and more importantly, Wilkinson and Willmott (1995) say that the academic establishment, business schools and academics specialising in management, have been slow to get to grips with TQM, leaving the leading advocates of quality management '... to enjoy a virtual monopoly over the discussion'.

The available literature, however, suggests that there is now reasonable agreement on the basic principles underlying TQM as a generic approach to the management of organisations and on the range of techniques of implementation. In this regard, and in an attempt to identify and define the basic elements of TQM, Hill and Wilkinson (1995) perceive TQM as a way of managing or philosophising management by drawing from work by Crosby (1979), Deming (1986), Feigenbaum (1993), and Ishikawa (1985). In their opinion, TQM is now seen as a holistic and organisation-wide approach based on three fundamental principles. These principles include:-

1. Customer orientation,
2. Process orientation,
3. Continuous improvement.

These three principles, as argued, are implemented in a specific manner and the mode of implementation is itself a defining feature of TQM. Implementation is by means of appropriate improvement tools, measurement systems and the processes of management and organisation. Zairi and Youssef (1995) defined TQM as:

"A positive attempt by the organisation concerned to improve structural, infrastructure, attitudinal, behavioural and methodological ways of delivering to the end customer, with emphasis on consistency, improvements in quality, competitive enhancements, all with the aim of satisfying or delighting the end customer."

Oakland (1993; 2000) define TQM as an approach to improving the effectiveness and flexibility of business as a whole through planning, organising, and understanding each activity and involving everyone at each level.

Another way to look at TQM is to analyse the three words: total, quality and management. According to Kanji (1990), quality means satisfying customers' requirement continually. Total quality is to achieve quality at low cost. Total quality management aims to obtain total quality by involving everyone's daily commitment.

This emphasises that TQM is not just a programme or a group of specific techniques, rather it is "a management approach" and a "culture", which implies a shift in an organisation's collective thinking and operation (Sashkin and Kiser, 1992). Ross (1999) regarded TQM as an integrated management philosophy and a set of practices that emphasises, among other things:

1. Continuous improvement,
2. Meeting customer requirements,
3. Reducing rework,
4. Long-range thinking,
5. Increased employee involvement and teamwork,
6. Process redesign,
7. Competitive benchmarking,
8. Team-based problem-solving,
9. Constant measurement of results,
10. Closer relationships with suppliers.

TQM has evolved as an approach to quality that is now characterised in terms of an integrated, systematic, organisation-wide strategy for improving product and service quality (Saylor, 1996). Kruger (1999) referred to TQM as a universal business strategy that is not culture-bound. It is equally applicable to manufacturing and service industries, private and public organisations, structures of different sizes, and to companies of any socio-cultural background.

Quality gurus

The implementation of TQM has been strongly influenced by the writings of Juran (1993), Crosby (1984), Feigenbaum, (1961) and Ishikawa (1985, 1993), which help us understand the essence of an effective TQM. Kruger (2001) argues that the early development of the TQ movement was substantially influenced by these few quality 'pioneers'.

Dr. Edward Deming

As Martinez-Lorente et al. (1998) point out it is difficult not to ravel the threads of W. Edwards Deming's impact on the post-war industrial recovery of Japan and its transformation from a manufacturer of shabby copies of Western goods to a pre-eminent producer of high-quality goods. He helped launch a campaign for institutionalizing 'quality control' within the Japanese manufacturing sector, which adopted a number of the terms and concepts he advocated. He provided a philosophical basis for the infusion of quality as an intrinsic part of the production process.

The main thesis of Deming is that by improving quality it is possible to increase productivity, which results in the improved competitiveness of a business enterprise (Sun, 2000). According to Deming, low quality means high costs, which will lead to a loss of the competitive position of the business organisation in the market. The quality improvement of the company's work processes will result in less reworking and less waste of manpower and material resources, and the number of errors will be reduced. The company's output will be achieved with less effort. The investments in reworking and defective parts, which are very costly, can be avoided. The lower costs will thus enable the enterprise to have a stronger competitive market position. In order to achieve this aim, Deming developed an approach, which is summarised in his 14-point programme (Deming, 1982) (Table 2.).

Table 2: 14-point quality programme (Deming, 1982)

1. Create constancy of purpose for improvement of product and service
2. Adopt new philosophy
3. Cease dependence on mass inspection
4. End practice of awarding business on price tag alone
5. Constantly and forever improve system of production and service
6. Institute modern methods of training on the job
7. Institute modern methods of supervision
8. Drive out fear
9. Break down barriers between staff areas
10. Eliminate numerical goals for workforce
11. Eliminate work standards and numerical quotes
12. Remove barriers that hinder hourly worker
13. Institute vigorous programme of education and training
14. Create a structure in top management that will push every day on above 13 points

There have been criticisms of Deming's approach. First, the action plan and methodological principles are too vague, implying that there is no clear Deming method. Deming failed to actually contextualise in an explicit holistic framework the implementation process of TQM. Hence, practising managers are faced with the difficulty of not knowing the "how, when and where" to start implementing his 14 points (Hellsten and Klefsjo, 2000). Secondly, the Deming philosophy is silent about external interventions in environments that are political and coercive, such as the NHS. In such an environment where the goalposts are continually shifting due to constant and concurrent governmental interventions, it is impossible to create a "constancy of purpose" (McAdam et al. 1998). Thirdly, Juran argues that Deming is wrong to tell management to drive out fear; "fear" according to Juran, can bring out the best in people (Kruger, 2001). Fourthly, Deming failed to represent his 14 points within an implementation framework, thereby creating a vacuum on what the specific cultural implications of the 14 points are. Such a framework would ensure that the introduction, sustainability and management of the TQM process take place.

Joseph Juran

Dr. Joseph Moses Juran was the first to broaden the understanding of quality control, emphasising the importance of the managerial aspect. His work is very detailed and comprehensive. It has to be pointed out that Juran first published his *Quality Control Handbook* as early as 1951 which highlights the importance Juran has achieved for his contribution towards our understanding of TQM .

Juran's main contribution was that quality control must be conducted as an integral part of the management function. He deplored the fact that with the Industrial Revolution and the strong growth of business enterprises using mass production methods, large companies were more and more split into functional departments. Many industries adopted the separating of planning from execution. As business enterprises grew further in size, the volume of activity outgrew the capacity of the company's management (Yamashina, 2000). It thus became increasingly necessary for management to delegate. Juran argues that once managing the quality issue was delegated to the subordinate hierarchy, it was no longer considered to be vital for the top management of the company to participate personally in managing quality (Kruger, 2001).

This progressive removal of the company's management from managing the quality issue led to negative effects on quality (Nwabueze, 2001), and in the end, nobody in the company felt responsible for quality. Since the worker, however, orientates himself towards the supervisor, the supervisor in turn towards the department manager, and the department manager to the board of directors, the visible leadership and personal involvement of top management in inspiring quality, as Juran explains, are a very important signal for every employee in the business organisation (Leitner, 1999).

Juran's approach suggests that quality control has to be conducted as an integral part of the management function, broadened the understanding of quality at the time (Kruger, 2001). Juran's (1974) principles of quality control are shown in Table 3.

Table 3: principles of quality control (Juran, 1974)

1. It is the responsibility of management to establish a Quality Control
2. Management should establish a Quality Policy
3. Management has to establish quality goals which should be expressed in numbers and should include a time frame
4. Once a specific goal has been established by management, it is then the responsibility of of management to provide the necessary resources needed to achieve the quality goals.

We can also understand Juran's contributions expressed in his quality trilogy (Table 4).

Table 4: Quality trilogy (Juran, 1993)

Quality planning	>	Quality control	>	Quality improvement
- Identify the customer for		- choose control subjects		- prove the need for improvement
- Determine the customers' needs projects		- choose units of measurement		- identify specific projects
- develop products features		- establish standards of performance		- organize for diagnosis for discovery of causes
- establish quality goals		- measure actual performance		- provide remedies
- develop a process		- interpret the difference		- prove that the remedies
- prove process capability		(actual vs standard)		are effective under operating conditions
- take action on the difference		-take action on the difference		provide for control to

Martinez-Lorente et al. (1998) refer to four main limitations of Juran's approach include. First, Juran's critics argue that his emphasis on management's responsibilities for quality fails to get to grips with the extensive literature on motivation, leadership and culture change.

Secondly, Juran's methods (quality planning, control and improvement) are mainly traditional and old-fashioned, failing to deal adequately with the human dimension of organisations, particularly cultural and political issues

Thirdly, Juran's methodology fails to address the issue of managerial politics involved in effecting a change in people's attitudes to work, which is the core of any change programme (Hellsten and Klefsjo, 2000: Sun, 2000).

Fourthly, a failure to effect a drastic change in people's attitudes and behaviours towards work, whilst implementing TQM, would amount only to a rearrangement of functional boxes and not to a concerted effort to change the way work gets done.

Philip B. Crosby

Philip Bayard Crosby is known for his concept of 'zero defects' and 'do it right the first time, which he expects to be the only standard of performance. Any other acceptable quality levels (AQL) are not good enough.

The start point of Crosby's (1979) concept is his statement that "Quality is free. It is not a gift, but it is free. What costs money were the unquality things – all the actions that involve not doing jobs right the first time". To be able to understand quality, it is helpful to deal first with a number of erroneous assumptions held by many managers. The first erroneous assumption according to Crosby is that quality means luxury or goodness signifying the relative worth of things. He makes it clear that quality has only to be defined as 'conformance to requirements' (Crosby, 1979).

The customer who talks about quality must define his expectations in specific terms (McAdam et al., 1998). Then exact measurement can be taken continually to determine conformance of the product or service to those requirements. In case non-

conformance is detected, this means absence of quality. Crosby points out that it is possible to measure quality quantitatively, as the costs of non-conformance are identical to the costs of quality – the costs of doing things wrong. Another erroneous assumption is that all quality problems originate with the workers of the company. Crosby does not, however, believe that the employees are the prime cause for poor quality (Ip et al., 1999).

Crosby gives four absolutes for quality management (Table 5).

Table 5: Quality management absolutes (Crosby, 1979)

1. DIRFT – do it right first time
2. System of quality is prevention
3. Performance standard is 'zero defects'
4. Measurement of quality is the price of non-conformance

He argues that management has to lead by example and the employees follow their example. As he notes, quality inspectors march blindly past the defects of accounting, engineering, computer programming, and marketing on their way to the manufacturing ghetto to look for errors (Yamashina, 2000). A fourth erroneous assumption, according to Crosby, is that quality originates in the quality department. He argues that, unfortunately, many quality professionals feel that they are responsible for quality in their business organisation.

These people must learn to call a problem by its real name, namely those who cause the problems, like marketing, accounting, manufacturing, and design problems.

Crosby points out that quality is the responsibility of every employee in the company. It is not the quality department which is kept responsible for resolving problems over which this department has no control or immediate access to. This leads to Crosby's idea of the quality vaccine, which can be used by business enterprises to prevent the problem of non-conformance. He argues that a business organisation can be vaccinated against non-conformance to quality requirements. He recommends applying his four absolutes of quality management (Leitner, 1999).

He proposes a 14-point plan which, he says, would facilitate the implementation of TQM (Table 6).

Table 6: 14-point plan to facilitate TQM implementation (Crosby, 1979)

1. Management commitment
2. Quality improvement team
3. Quality measurement
4. Cost of quality evaluation
5. Quality awareness
6. Corrective action
7. Establish temporary committee for zero defect programme
8. Supervisor training
9. Zero defect day
10. Goal setting
11. Removal task and error causes
12. Recognition
13. Quality councils
14. Do it again

Crosby's philosophy has been criticised from a number of quarters (Nwabueze, 2001). For example, Juran and Deming argue that it is pointless, if not hypocritical, to exhort a line worker to produce perfection (zero defects), since the overwhelming majority of imperfections are due to poorly designed manufacturing systems beyond the worker's control.

In the National Health Service (NHS), for example, (Nwabueze, 2001) has noted that the Crosby approach is good in detail, but lacking in substance. Furthermore, managers see Crosby's model as over-long (14 steps) and a complicated process designed to achieve relatively simple ends. NHS managers were therefore more positively drawn to an informal approach introduced through people who were concerned with improvements (Martinez-Lorente et al., 1998).

Armand V. Feigenbaum

Feigenbaum (1961) was the first author who used the term TQC. In his first book on TQC (Feigenbaum, 1961) (a revision of the book original published under the title Quality Control in 1951), he considered that "control must start with the design of the product and end only when the product has been placed in the hands of a customer who remains satisfied". He defined TQC as "an effective system for integrating the quality-development, quality maintenance, and quality-improvement efforts of the various groups in an organisation so as to enable production and service at the most economical levels which allow for full customer satisfaction".

In this book, Feigenbaum recognised that all departments in a company have some responsibility for the achievement of quality, as Feigenbaum originally perceived it. However, TQC did not include many of the elements (e.g. supplier developmental relationships, people empowerment and teamwork) that are now considered part of the TQM concept (Martinez-Lorente et al., 1998).

In the 1950s, Feigenbaum worked as quality manager at the General Electric Company and had intensive contacts with companies such as Toshiba and Hitachi. From 1958 to 1968, Feigenbaum became the worldwide Director of Manufacturing Operations at the General Electric Company.

Feigenbaum develops his approach to TQM, dealing with elements like management of quality, the system for total quality, management strategies and quality, engineering technology and quality, statistical technology and the application of total quality in the enterprise (Martinez-Lorente et al., 1998).

Feigenbaum's contributions can be summarised in two main points (Hellsten and Klefsjo, 2000) (Table 7).

Table 7: Feigenbaum's (1993) approach to TQM

1. Quality is the responsibility of everybody in the company ranging from top management to unskilled workers.
2. Costs of non-quality have to be categorised if they are to be managed. Costs of control and costs of failure of control have to be minimised by a quality improvement programme.

TQM is to provide the fundamental basis of positive commitment to quality for all employees of the business organisation, from management to assembly workers. Feigenbaum contributed two new aspects to the discussion about quality. Quality is the responsibility of everybody in the company ranging from top management to the unskilled worker. It involves everyone. It is a positive effect of TQM that it should build up employee responsibility for product quality. Each individual employee should become interested in product quality. It is the total participation of all employees and the total integration of all the company's technical and human resources that will lead to long-term business success (McAdam et al., 1998; Ip et al., 1999). Quality is produced not only by the production department, but also by marketing, research and development, finance, purchasing, and any other department.

TQM, so Feigenbaum argued, needs effective ways to integrate the efforts of large numbers of employees with large numbers of machines and technologies.

The costs of control should be measured, Feigenbaum argues, in two principal areas: prevention costs (e.g. quality training of employees) should keep defective parts from occurring, and appraisal costs (e.g. quality audit costs) cover the costs for maintaining the quality level of the company. The costs of failure of control are also measured in two areas: internal failure costs (e.g. scrap) and external failure costs (e.g. customer complaints, reworked material) (Sun, 2000).

Furthermore, Feigenbaum first recognised that costs of non-quality have to be categorised if they are to be managed. Costs of control and costs of failure of control have to be minimised by a quality improvement programme (Nwabueze, 2001). Feigenbaum notes that, "We have been spending our quality dollars the wrong way: a fortune down the drain because of product failures; another large sum to support a sort-the-bad-from-the-good appraisal screen to try to keep too many bad products from going to the customer; comparatively nothing for the true defect-prevention technology that can do something about reversing the vicious upward cycle of higher quality costs and less reliable product quality" (Feigenbaum, 1993).

The more defective parts, Feigenbaum argued, the higher the failure costs. The traditional reaction to higher failure costs has been more inspection. This traditional post-production inspection syndrome only tries to separate the good parts from the defective ones, but does not make any allowance for prevention of defective parts during the production process itself. Feigenbaum's intention is not so much to create managerial awareness of quality as to assist a business enterprise to design its own quality system, which involves every employee (Leitner, 1999). He offers a highly structured approach to total quality which, however, hardly covers the question of motivation and commitment of the individual employee to quality.

Feigenbaum suggests, in order reducing both failure costs and appraisal costs, increasing the expenditure for prevention. Prevention of defects will lead to a reduction of defective parts (Kruger, 2001). This will thus have, Feigenbaum maintains, a substantial reduction in failure costs. Moreover, an increase in prevention costs will result in fewer defective parts and, consequently, will lead to a reduced need for routine post-production inspection and extensive test activities. The final result is a clear reduction of the company's overall costs of non-quality and an improvement of its competitive situation.

Kaoru Ishikawa

Kaoru Ishikawa substantially influenced the Japanese understanding of quality. Ishikawa has become known for his work on, in particular, four aspects of TQM: quality circles, the question of continuous training, the quality tool “Ishikawa diagram”, and the quality chain. His approach to TQM comes very close to today’s understanding of TQM. As Ishikawa remarks, Japanese quality control is a thought revolution in management. It is an approach representing a new way of thinking about management. To meet this goal, everyone in the company must participate in and promote quality control, including top executives, all divisions within the company, and all employees (Ishikawa, 1985). To practice quality control is to develop, design, produce and service a quality product which is most economical, most useful, and always satisfactory to the consumer.

Top management has to lead by example and to demonstrate actively that they are serious about quality. TQM involves everyone within the company; every employee should contribute his ideas of how to improve the work processes. In this definition, Ishikawa covers a number of key elements of total quality (Yamashina, 2000).

TQM emphasises a clear customer orientation - internal and external. The needs of the customer have to be satisfied. TQM is not limited to the quality department but involves all departments within the business organisation.

Ishikawa (1985) identified 14 areas of difference between Japan and the West. However, there are 6 points, which deserve our attention (Table 8).

Table 8: 6 points, of difference between Japan and West (Ishikawa, 1985)

1. In USA and Western Europe, great emphasis is placed on professionalism and specialisation; “QC only for QC specialists”.
2. In USA and Western Europe, great emphasis placed on Taylor system.
3. Pay system in the USA and Western Europe based on merit (to motivate people by money alone). Japan uses system of seniority and ranking.
4. High turnover rates and layoffs are found in the West; Japan has a lifetime employment system.
5 Relationships with subcontractors – 70% of product manufacturing costs contributed by outside suppliers in Japan, and only 50 per cent in the USA. Subcontractors treated as friends not enemies as is the case in the West.
6. Old-style capitalism versus democratisation of capital: short-term profits versus long-term profits.

Ishikawa (1985) claims that TQM “begins with education and ends with education”. Ishikawa considers the implementation of quality circles as an effective way of getting the shop floor involved in the quality issue. This involvement of all employees in the company’s problem-solving process requires a continuous education and training of everyone in the company. He describes the importance not only of meeting the requirement of the external customer, but also of paying attention to “internal” customers and internal relationships. He develops a continuous line of internal supplier-customer relations and invented the term “The next process is your customer” (Yamashina, 2000).

Ishikawa stresses the importance that, “QC training and education must also be carried out without interruption, through good times and bad”.

The Japanese quality expert defines as the aim for a training programme that quality should be made everybody’s concern. Every employee should understand the new philosophy of quality. Moreover, everyone should grasp the tools and techniques of TQM (Martinez-Lorente et al., 1998).

It must be the common goal of each department to fully satisfy this customer. Therefore it would be helpful if the next work process and the next workstation, which builds on the added value and work of the previous workstation, were considered as a customer. Sectionalism must be broken down. Every employee should be able to talk to other department members freely and frankly. It is necessary to learn to think from the standpoint of the other party (Hellsten and Klefsjo, 2000; Ip et al., 1999). All the different departments within the company are living from the very same external customer. The next work process should be treated like the external customer. We can agree that Ishikawa has contributed and formed a number of important ideas in today’s understanding of TQM.

Models of TQM

Various models are offered by TQM experts as well as by Quality Award associations to help organisations in their drive for TQM implementation.

Models offered by quality experts and consultants

There are many experts and consultants who identified success factors for TQM implementation. There is no-one-size-fits-all model. However, the various models offered by experts can help firms in the implementation process.

Some of the models that are adopted by UK companies are those of Kanji et al. (1997, 1998) and Oakland (1993, 1989, 2000). The model proposed by Oakland (1993, 2000) at Bradford’s European Centre for TQM, which is adopted by the DTI, has as its core theme the identification and management of processes within the organisation.

The processes are seen as chains of internal and external customer-supplier relationships that must be managed effectively and efficiently. Surrounding the processes are the ‘soft’ outcomes of TQM – culture, communication and commitment, and ‘hard’ management necessities of TQM – the use of teams (ranging from high-powered quality councils to work-area quality circles), quality tools (for systematic data collection and analysis) and systems (based on recognised international standards).

Kanji (et al. 1993) use a 4-sided ‘pyramid’ model to show the structure of TQM (Table 10). It encompasses a set of four general governing principles, represented by the four sides. Each of the principles is translated into practice by using two core concepts.

1. ‘Leadership’ sits at the base of the pyramid, aptly emphasising the critical role of leadership to make TQM happen.

Table 10: Pyramid model structure of TQM, (Kanji et al., 1993)

<u>Principles</u>		<u>Concepts</u>
Delight the customers real	customer satisfaction	internal customers are real
Management-by-fact	all work is a process	measurement
People-based management	teamwork	people make quality
Continuous improvement	continuous improvement cycle	prevention

Kanji's (1995,1998) modified pyramid model is based on the proposition that to achieve customer satisfaction level (delight the customer), the organisation has to improve continuously all aspects of its operations (continuous improvement); this can be achieved through leadership by making decisions on objective evidence of what actually was happening (management-by-fact), and by involving all employees in quality improvement activities (people-based management), leading ultimately to business excellence. His modified pyramid model, together with the four-stage process of implementing TQM, represents an attractive and practical implementation framework for companies to follow (Yusof and Aspinwall, 2000).

The four stages are identification and preparation, management understanding and commitment, scheme of understanding, and critical analysis. Kanji (1995) points out that the need to identify and collect information where improvement will have the most impact. This requires management information of a data collection system of a fact-based approach.

2. Oakland (1993, 2000) proposes a model for TQM implementation where the customer-supplier chains form the core, which is surrounded by the hard management necessities of a good quality system, tools and teamwork. He proposes seven steps for senior management to begin the task of process alignment to a self-reinforcing cycle of commitment, communication and cultural change. The first three steps are:

- Gain commitment to charge
- Develop shared vision and mission for business or desired charge
- Develop critical success factors.

The remaining four steps comprise: defining the core processes and gaining ownership; breaking down the core processes into sub-processes, activities and tasks; and ensuring process and people alignment through a policy deployment or goal translation process.

3. Dale et al. (1990) identified 21 points which organisations should consider important in the process of TQM implementation (Table 11).

Table 11: 21 points important in TQM implementation (Dale et al., 1990)

1. Top management commitment and support vital for credibility,
2. continuity and longevity of process.
3. Establishment of multidisciplinary quality-improvement steering
4. committee chaired by Chief Executive Officer is essential.
5. Quality control activity separated from quality improvement process.
6. Set goals for improvement and develop quality objectives and strategies.
7. In development of TQM, use of management tools, techniques and package required at different stages in different organisations.
8. Success of process depends on timing of introduction of particular tool, technique or package.
9. Senior Management team must identify and tackle main quality problems.
10. Integration of quality improvement process with other organisational improvement initiatives is vital to success.
11. Efforts to ensure that all potential non-conformances are identified and eliminated at design stage.
12. Dedication to remove basic causes of errors.
13. Teamwork vital to success of TQM. People should be involved.
14. Develop them by providing quality education and training to bring about
15. changes in their behaviour and attitudes.
16. Quality assurance system well documented and also provide direction and feedback.
17. Mistake-proving operations to be investigated and remedied.
18. Customer and supplier relationships to be developed and improved.
19. No ideal way recommended for assuring the quality of organisation's product or service. In order to sustain process, results must be cost-effective.
20. Establish measures of customer satisfaction and quality indicators for all internal functions/departments and encourage attitude that 'the next process/person is the customer'.
21. Internal and external customer must be able to complain, and customer complaints are analysed and feedback ensured into organisation.
22. Develop system by which all staff can raise problems faced by them in conducting error-free performance.
23. Statistical methods used to support the analysis.
24. Effective internal audit procedure of quality assurance system developed and in place.
25. With patience and tenacity, always develop future plans for at least ten years.

4. Kano (1993) showed the structure of TQM using 'The House of TQM' concepts. The theory of quality and theory of management form the first pillars of the house. These concepts are promoted by the practice of the Plan-Do-Check-Act cycle that ensures customer satisfaction. The concepts from the second pillar (techniques) for collection and analysing data are the basis of actual practices.

Of these techniques, seven quality control tools and statistical methods are typical. At some stage of the TQM initiative, it becomes necessary to effectively and efficiently promote these two pillars within an organisation for which the third pillar called the

'vehicles' is engaged, which comprises management policy for continuous improvement and training as well as employee involvement.

5. Evans and Lindsay (2001) suggest that TQM is a philosophy or an approach grounded on three core principles:

- Customer focus
- Teamwork and participation
- Continuous improvement

These above three principles are suggested to be supported and implemented by:

- Integrated organisational infrastructure
- Variety of management practices
- Wide range of tools and techniques

Leadership, strategic planning, data/information management, process management and resource management must also form as part of the TQM architecture of which the major components are organisational infrastructure, management practices and tools/techniques.

6. Brocka and Brocka (1992) recommended seven principles to achieve TQM implementation success (Table 12).

Table 12: Seven principles to achieve TQM implementation success (Brocka and Brocka, 1992)

<ol style="list-style-type: none">1. Top leadership commitment and participation2. Develop and sustain culture committed to continuous improvement3. Dedicated focus on satisfying customer needs and expectations4. Involve and help every individual to achieve improvement in his/her work5. Develop constructive working relationships and create teamwork6. Value people as most important resource7. Best available management practices, techniques and tools are employed.
--

7. Hunt and Al-Tuwaijri (1996) supports the view that the essence of quality management is the concepts of TQM. The essence of quality management is the ultimate customer satisfaction that can be brought about by the employees by involving and empowering them improve the quality of services and goods. This level of performance can be reached only when the workforce are able to identify the customer and their needs/expectations, as well as a clear knowledge of how the organisation plans to achieve the goal of meeting customer needs/expectations. He also suggests the following quality concepts.

- Top management leadership
- Strategic planning

- Customer focus
- Employee team work and empowerment
- Continuous process improvement

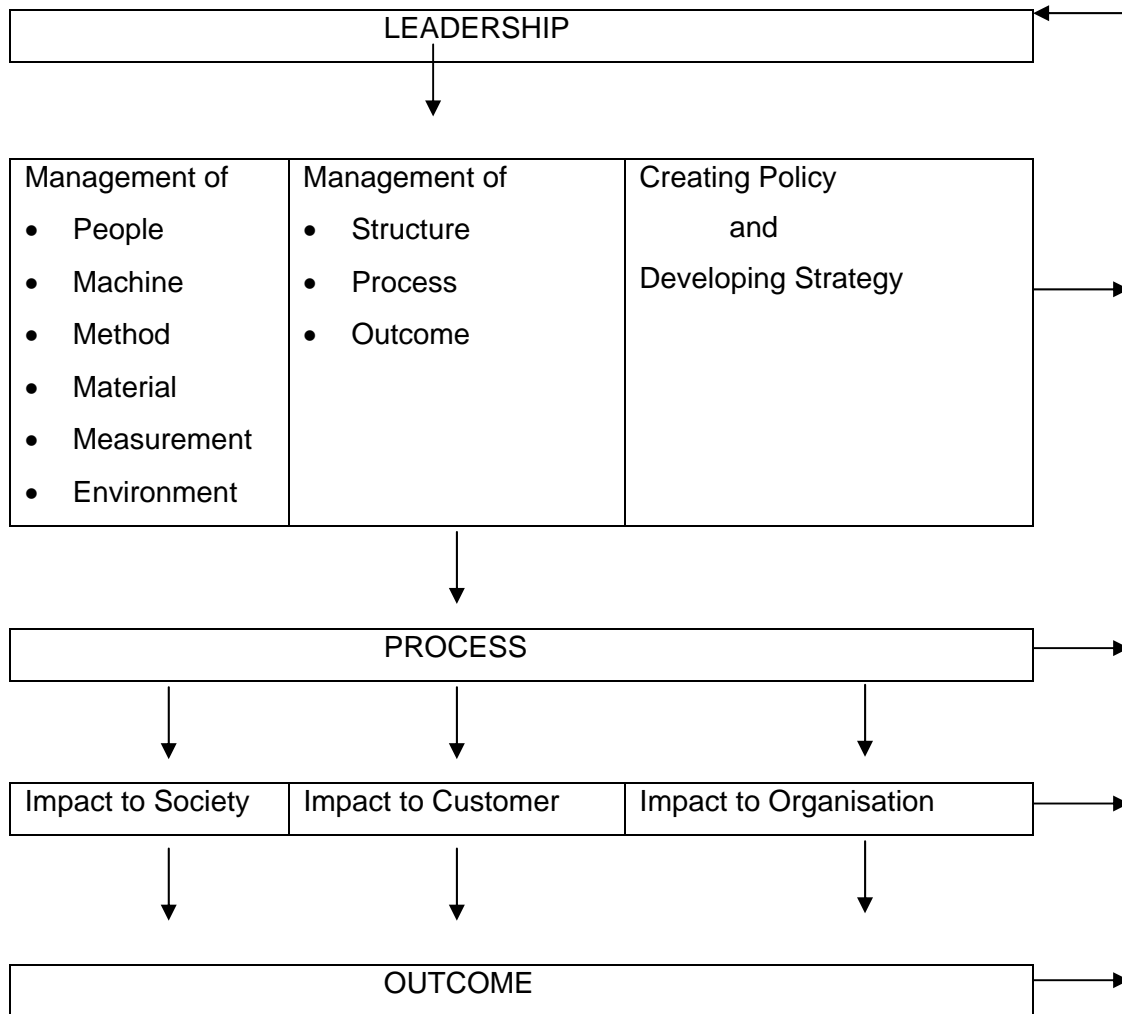
8. According to Stamtis (1997), the following five assumptions shown in Table 13 are essentially required for TQM implementation.

Table 13: Five assumptions essential for TQM implementation (Stamtis, 1997)

1	Customer Focus (both internal and external)	Customer needs must be identified and understood
2	Total Involvement (Commitment)	Commitment and leadership must be demonstrated by management through providing opportunities for employees to improve quality. Set up multidisciplinary, cross-functional and self-directed teams for employees to be part and also empower employees to improve their work environment.
3	Measurement	Management must establish appropriate measures of process and results and also establish measure with customers as focus.
4	Systematic Support	Managing quality process is the responsibility of management and there the quality infrastructure be tied up to the internal management structure, thereby linking the quality to existing management systems.
5	Continuous Improvement	All work must be viewed as a process. Management's responsibility to anticipate or expect changes in the needs, wants and expectations of customers, employees and society.

Figure 1 shows that the management through leadership is the basis for QTM. It is asserted by Stamtis (1997) that once the leadership has been defined, thereafter a policy, resources and general management together will guide the TQM process which transforms the input into results in satisfying society, customers, and organisation.

Figure 1: Five Assumptions Required to Implement TQM (Stamtis's, 1997)



Source: Stamtis (1997)

References

- Adebanjo, D. and Kehoe, D.(2001) 'An evaluation of factors influencing teamwork and customer focus'. *Managing Service Quality*, Vol.11, No.1, pp.49-56.
- Al-Nofal, A. and Zairi, M. (2002b) 'Best practices and sustainable TQM implementation'. *Proceedings. 7th World Congress for Total Quality Management: Business Excellence: Make it happen*, Verona, Italy. 25-27 June.
- Andersen, B. and Moen, R.(1999) 'Integrating benchmarking and poor quality cost measurement for assisting the quality management work'. *Benchmarking: An International Journal*, Vol.6, No.4, pp.291-301.
- Appelbaum, S., Gandell, J., Shapiro, B., Belisle, P. and Hoeven, E. (2000) 'Anatomy of a merger: behavior of organisational factors and processes throughout the post-stages'. *Management Decision*, Vol.38, No.10, pp.674-684.
- Aune, A. (1998) 'Quality and quality management at a crossroads'. *Total Quality Management*, Vol.9, No, 4/5, pp. S6-S16.
- Clarke, S. (1998) 'Trade union and the non-payment of wages in Russia', *International Journal of Manpower*, Vol.19, No.1/2, pp.68-94.
- Cornford, J. (2001) 'Integrating local resource'. *Library Management*, Vol.22, No.1/2, pp.19-20.
- Crosby, P. (1979) *Quality Is free, The art of making quality certain*. New York, NY: Penguin Books.
- Davies, A. and Kochhar, A. (1999) 'Why British companies don't do effective benchmarking'. *Integrated Manufacturing Systems*, Vol.10, No.1, pp.26-32.
- Deming, W.E. (1986) *Out of the Crisis*. Cambridge, MA: Cambridge University Press.
- Deming, W.E. (1986) *Out of the crisis*. MIT Center for Advanced Engineering Study. Cambridge, MA: Cambridge University Press.
- Fong, S., Cheng, E. and Ho, C. (1998) 'Benchmarking: a general reading for management practitioners'. *Management Decision*, Vol.36, No.6, pp.407-418.
- Garvare, R. and Isaksson, R. (2001) 'Sustainable development: extending the scope of
- George, S. and Weimerskirch, A. (1998) *Total quality management: Strategies and Techniques proven at today's most successful companies*. Place: New York. Chichester, Wiley.
- Gore, E.W. (1999) *Organisation culture, TQM, and business process reengineering: an empirical comparison*. *Team Performance Management, An International Journal*, Vol.5, No.5, pp.164-170.

Gore, C., Bond, C. and Steven, V. (2000) 'Organisational self-assessment: measuring educational quality in two paradigms', *Quality Assurance in Education*, Vol.8, No.2, pp.76-84.

Guimaraes, T. and Armstrong, C. (1998) 'Empirically testing the impact of change management effectiveness on company performance'. *European Journal of Innovation Management*, Vol.1, No.2, pp.74-84.

Gummesson, E. (1998) 'Productivity, quality and relationship marketing in service operations'. *International Journal of Contemporary Hospitality Management*, Vol.10, No.1, pp.4-15.

Hackett, M. and Spurgeon, P. (1998) 'Developing our leaders in the future'. *Health Manpower Management*, Vol. 24, No.5, pp.170-177.

Hales, C. and Klidas, A. (1998) 'Empowerment in five-star hotels: choice, or rhetoric?' *International Journal of Contemporary Hospitality Management*, Vol.10, No.3, pp.88-95.

Hunt, D.M and At-Twajiri, M. (1996) 'Values and the Saudi manager: an empirical investigation'. *Journal of Management Development*, Vol.15, No.5, pp.48-55.

Johnson, H. T. (1993) 'To achieve quality, you must think quality'. *Financial Executive*, Vol.37, No.6, pp.58-60.

Juran, J. M. (1993) 'A Renaissance in quality'. *Harvard Business Review*, Vol.71, No.4, pp.42-50.

Kouzman, A., Klages, E. and Kakabadse, N. (1999) 'Benchmarking and performance measurement in public sectors'. *The International Journal of Sector Management*, Vol.12, No.2, pp.121-144.

Larsen, B. and Haversjo, T. (1999) 'ISO9000 quality assurance in an extreme situation: quality management in a home for multi-handicapped'. *Management Service Quality*, Vol.9, No.1, pp.23-31.

Lee, M. and Cunningham, L. (2001) 'A cost/benefit approach to understanding service loyalty'. *Journal of Services Marketing*, Vol.15, No.2, pp.113-130.

Lee, P. and Quazi, H. (2001) 'A methodology for developing a self-assessment tool to measure quality performance in organisations'. *International Journal of Quality & Reliability Management*, Vol.18, No.2, pp.118-141.

Lee, R. and Dale, B. (1998) 'Policy deployment: an examination of the theory'. *International Journal of Quality & Reliability Management*, Vol.15, No.5, pp.520-540.

McAdam, R. and Reid, R. (2000) 'A comparison of public and private sector perceptions and use of knowledge management'. *Journal of European Industrial Training*, Vol.24, No.6, pp.317-329.

Millar, I. (1999) 'Performance improvement. Part 1. Forget the acronyms'. *Industrial Management & Data Systems*, Vol.99, No.4, pp.172-180.

Oakland, J. S. (2000) *Total quality management – Text with cases*. 2nd Edition. Butterworth-Heinemann.

Piercy, N. F. (1997) *Market-led Strategic Change: transforming the process of going to market*. Oxford:Butterworth-Heinemann.

Pitt, D. (1999) 'Improving performance through self-assessment'. *International Journal of Health Care Quality Assurance*, Vol.12, No.2, pp.45-54.

Poole, M. and Jenkins, G. (1997) 'Responsibilities for human resource management practices in the modern enterprise'. *Personnel Review*, Vol.26, No.5, pp.333-356.

Powell, T. C. (1995) 'Organisational alignment as competitive advantage'. *Strategic Management Journal*, Vol.13, No.2, pp.15-37.

Rees, C. (1999) 'Teamworking and service quality: the limits of employee involvement'. *Personnel Review*, Vol.28, No.5/6, pp.455-473.

Richardson,T.(1996) *Total quality management*. Delmar Publisher.

Robin, M. and Dennis, K. (1995) 'Factors affecting the implementation and success of TQM'. *International Journal of Quality and Reliability Management*, Vol.12, No.1, pp.11-23.

Robledo, M. (2001) 'Measuring and managing service quality: integrating customer expectations'. *Managing Service Quality*, Vol.11, No.1, pp.22-31.

Saraph, J. V., Benson, P. G. and Schroeder, R. G. (1989) 'An instrument for measuring the critical factors of quality management'. *Decision Sciences*, Vol.20, No.4, pp.810-829.

Sarkis, J. (2001) 'Benchmarking for agility'. *Benchmarking: An International Journal*, Vol.8, No.2, pp.88-107.

Steiner, C. (2001) 'A role for individuality and mystery in "managing" change'. *Journal of Organisational Change Management*, Vol.14, No.2, pp.150-167.

Stough, S., Eom, S. and Buckenmyer, J. (2000) 'Virtual teaming: a strategy for moving your organisation into the new millennium'. *Industrial Management & Data Systems*, Vol.100, No.8, pp.370-378.

Tuffrey, M. (1997) 'Employees and the community: how successful companies meet human resource needs through community involvement'. *Career Development International*, Vol.2, No.1, pp.33-35.

Twomey, D. and Twomey, R. (1998), 'UK business schools and business: activities and interactions'. *Journal of Management Development*, Vol.17, No.3, pp.160-176.

van der Big, H. and van Ekert, J.(1999) 'Interaction between production control and quality control'. *International Journal of Operations & Production Management*, Vol.19, No.7, pp.674-690.

Watson, R. (1998) 'Implementing self-managed process improvement teams in a continuous improvement environment'. *The TQM magazine*, Vol.10, No.4, pp.246-257.

Wiley, C. (1997) 'What motivates employees according to over 40 years of motivation surveys'. *International Journal of Management*, Vol.18, No.3, pp.263-280.

Wimalasir, J. S. and Kouzmin, A. (2000) 'A comparative Study of employee involvement initiatives in Hong Kong and the USA'. *International Journal of Manpower*, Vol.21, No.8, pp.614-634.

Xie, M. and Goh, T. (1999) 'Statistical techniques for quality'. *The TQM Magazine*, Vol.11, No.4, pp.238-242.

Zink, K. and Voss, W. (1998) 'Quality in Germany- an overview'. *The TQM Magazine*. Vol.10, No.6, pp.458-463.