TOTAL QUALITY MANAGEMENT: RELEVANCE AND IMPLICATIONS

By Michael D. Nungu, FCMA, FCIS, MBA.
Senior Lecturer at The Institute of Finance Management, Dar es Salaam.

Abstract

The theme of this paper is Total Quality Management (TQM). Quality is defined and costs of quality are explained. The paper argues that the prevailing competitive environment requires managers to seriously consider the introduction of TQM into their approach to manage organizations.The paper further highlights numerous advantages of TQM. The paper concludes with a caution that management commitment is the first most important requirement for TQM to succeed.

Introduction

The environment in which businesses are conducted is very turbulent and very competitive. To survive in such a competitive atmosphere of modern manufacturing, a company must adhere strictly to standards. It is for this reason that quality is the 'buzz-word' in most organisations. Indeed, quality is said to be of strategic importance in global market. A country like Tanzania which is now trumpeting open competition must take seriously issues related to quality.

Definition of TQM

There is quite a good number of definitions of TQM. The following definitions will highlight what is to be expected in TQM. The first one is a definitive version of a mission statement (attributed to the British Quality Association) which encompasses what TQM is about in the following way:

"Total Quality Management (TQM) is a corporate business management philosophy which recognises that customer needs and business goals are inseparable. It is applicable within both industry and commerce. It ensures maximum effectiveness and efficiency within a business and secures commercial leadership by putting in place process and systems which will promote excellence, prevent errors and ensure that every aspect of the business is aligned to customer needs and the advancement of business goals, without duplication or waste of effort, by releasing the full potential of all employees.

The commitment of TQM originates at the chief executive level in business and is promoted in all human activities. The accomplishment of quality is thus achieved by personal involvement and accountability, devoted to a continuous improvement process, with measurable levels of performance by all concerned.
It involves every department, function and process in a business and the active commitment of all employees to meeting customer needs. In this regard the 'customers' of each employee are separately and individually identified". (British Quality Association, 1990)

Yes another definition of TQM from the U.S Department of Defence's (1990) *Total Quality Management Guide.*

"TQM is both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organisation. TQM is the application of quantitative methods and human resources to improve materials and services supplied to an organisation, all the processes within an organisation, and the degree to which the needs of the customer are met, now and in the future. TQM integrates fundamental

management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous improvement."

And the BS 4778 Part 2 defines TQM as:

"A management philosophy embracing all activities through which the needs and expectations of the customer and the community, and the objectives of the organisation are satisfied in the most efficient and cost effective way by maximising the potential of all employees in a continuing drive for improvement".

and put simply in the words of Barrie G. Dale and Cary L. Cooper, TQM is the mutual co-operation of everyone in the organisation and associated business processes to produce products and services which meet the needs and expectations of customers TQM is a combination of a philosophy and some guiding managerial principles for managing an organisation, based on a fundamental belief in the need for continuous and company-wide improvement. It is all about good management behaviour and business practice.

TQM is a concept which emphasises a continuous recognition and improvement of the needs and requirements (and subsequent changes thereof) of the customer, but also at the same time taking on board the objectives of the organisation and the worker. TQM, therefore, is a concept which any serious organisation cannot afford to do without.

The concept of Quality

The following words by various authors clearly emphasize what is involved in quality.

"The first erroneous assumption is that quality means goodness, or luxury or shine, or weight. The word 'quality' is used to signify the relative worth of things in such phrases as 'good quality', 'bad quality', and that brave new statement 'quality of life'. 'Quality of Life' is a cliché because each listener assumes that the speaker means what he or she, the listener, means by the phrase. It is a situation in which individuals talk dreamily about something without ever bothering to define it. That is precisely the reason why we must define quality as 'conformance to requirements' if we are to manage it. Thus, those who want to talk about quality of life must define that life in specific terms, such as desirable income, health, pollution control, political programs, and other items that can each be measured. If a Cadillac conforms to all the requirements of a Cadillac, then it is a quality car, If a Pinto conforms to all the requirements of a Pinto then it is a quality car. Don't talk about poor quality or high quality. Talk about conformance and non-conformance". (Philip Grosby, 1979)

The emphasis in Crosby's definition is 'conformance to requirements'.

Other equally good definitions include the following:-

"The total composite product and service characteristics of marketing, engineering, manufacturing and maintenance through which the product or service in use will meet the expectations of the customer". (Armold Feigenbaum, 1990) *"Quality if fitness for purpose or use".* (Joseph Juran, 1986)

Until recently quality has been considered from three fronts—Quality Control; Quality Assurance; and Total Quality.

In a nutshell-Quality Control is the control of quality during an operational process and at the post process stage. It involves containment and inspection. Quality Assurance is the achievement of specified levels of quality by the removal of the root causes of poor quality. Essentially this is problem solving and prevention. Total Quality is the application of quality assurance to every company activity, so that zero defects are achieved. Total quality is characterised by proper application of good practice quality management principles as advocated by the quality 'gurus' and authorities mentioned above.

The costs of quality

It is necessary to consider quality costs because such costs will have a considerable effect on the company's overall profitability. This is amplified by Armold Feigenbaum in studies made in the USA in the 1980s, when it was established that quality costs amounted to between 10% and 20% of sales; while the net profit ended up to a mere 5% of sales (Armold Feigenbaum, 1990). Surely this is alarming, and it is an issue calling for the urgent attention and response of the managers. And no wonder figures for quality costs are more alarming in developing countries like Tanzania.

Quality Costs are well categorised by Juran, to include:

Internal Failure Costs: These are costs from product defects before shipment to the customer. They include the following:

Scrap - Net losses in labour and material resulting from defective goods that cannot economically be repaired or used.

Rework- Costs of correcting defective products to make them usable.

Retest - Costs of re inspection and retesting of products that have been reworked.

Downtime - Costs of idle facilities, equipment, and labour due to defective products.

Yield Losses - Costs of process yields lower than could be attained through improved process control.

Disposition - The time of those involved in determining whether non conforming products are usable and what should be done with them.

External Failure Costs: These are costs associated with defects found after shipment to customer. They include the following:

Complaint Adjustment - Costs of investigating and responding to complaints due to defective products, faulty installations, or proper instructions to users.

Returned Material - Costs associated with receiving and replacing defective products returned from the field.

Warranty Charges - Costs of services and repairs performed under warranty contracts.

Allowances - Income losses due to downgrading products for sale as seconds and to concessions made to customers who accept substandard products as is.

Appraisal Costs: These are costs associated with discovering the condition of products and materials. They include the following:

Incoming Materials Inspection - Costs associated with determining the quality of vendor's products.

Inspection and Test - Costs of checking product conformance throughout design and manufacture, including tests done on customers' premises.

Maintaining Accuracy of Test Equipment - Costs of operating and maintaining measuring instruments.

Materials and Services Consumed - Costs of products consumed in destructive tests; also materials and services (e.g. electric power) consumed in testing.

Evaluation of Stock - Costs of testing products in storage to assess their condition.

Prevention Costs: These are costs associated with preventing defects and limiting failure and appraisal costs. They include the following:

Quality Planning - Costs of creating and communicating plans and data systems for quality, inspection, reliability, and related activities—includes the costs of preparing all necessary manuals and procedures.

New Products Review - Costs of preparing bid proposals, evaluating new designs, preparing test and experimentation programs, and related quality activities associated with launching new products.

Training - Costs of developing and conducting training programs aimed at improving quality performance.

Process Control - Costs of process control aimed at achieving fitness for use, as distinguished from productivity (a difficult distinction to make in practice).

Quality Data Acquisition and Analysis - Costs of operating the quality data system to get continuing data on quality performance.

Quality Reporting - Costs of bringing together and presenting quality data to upper management.

Improvement Projects - Costs of building and implementing break through projects.

There can be many other quality costs depending on the nature of the industry and the type of customers to be satisfied. However, an important issue to constantly remember is to ensure that quality costs are controlled and kept to a minimum. Philip Crosby, has suggested that if quality is to be managed properly, quality costs should not be allowed to exceed 2.5% of sales. The ultimate aim, however, should be to eliminate and avoid completely all costs related to quality.

Towards Total Quality Management

It is deemed desirable for a company to have developed some stage of quality control and quality assurance—although this is generally not regarded as essential. TQM is concerned with turning a company around in terms of improving overall performance by focusing on quality. TQM is supposed to start at the top. If these initiatives have been going on for sometime, TQM will definitely help to bring them all together in one drive.

Introducing TQM in Tanzania

It should be borne in mind that to introduce TQM into the Tanzania's organisations will undoubtedly mean bringing change in the companies and industries. This is a delicate issue, because, any change in whatever form is likely to meet resistance. It is against this background that any TQM initiative must lie squarely on the shoulders of management, and in particular top management, who are the only recognised capable agent for change. Embarking on a TQM initiative is a strategic decision which can only be handled by top management—because TQM needs the commitment, confidence, conviction, and indeed the involvement of the senior managers.

As earlier said, change is the responsibility of top management. That is why, W.E. Deming has summarised in a 14-point program, which if properly adhered to, managers should experience little difficulty in getting TQM off the ground. The following are Deming's 14 points as summarised by Artemis march [as Note on Quality: The views of Deming, Juran, and Crosby] of Harvard Business School:-

1. *Create constancy of purpose for improvement of product and service.* Management must change from a preoccupation with the short run to building for the long run. This requires dedication to innovation in all areas to best meet the needs of customers.
2. *Adopt the new philosophy.* Shoddy material, poor workmanship, defective products, and lax service must become unacceptable.
3. *Cease dependence on mass inspection.* Inspection is equivalent to planning for defects; it comes too late and is ineffective and costly. Instead, processes must be improved.
4. *End the practice of awarding business on price tag alone.* Price has no meaning without a measure of the quality being purchased. Therefore, the job of purchasing will change only after management establishes new guidelines. Companies must develop long-term relationships and work with fewer suppliers. Purchasing must be

given statistical tools to judge the quality of vendors and purchased parts. Both purchasing and vendors must understand specifications, but they must also know how the material is to be used in production and the final customer.

5. *Constantly and forever improve the system of production and service.* Waste must be reduced and quality improved in every activity: procurement, transportation, engineering, methods, maintenance, sales, distribution, accounting, payroll customer service, and manufacturing. Improvement, however, does not come from studying the defects produced by a process that is in control but from studying the process itself. Most of the responsibility for process improvement rests with management.
6. *Institute modern methods of training on the job.* Training must be restuctured and centred on clearly defined concepts of acceptable work. Statistical methods must be used for deciding when training has been completed successfully.
7. *Institute modern methods of supervising.* Supervisors must be empowered to inform upper management about conditions that need correction; once informed, management must take action. Barriers that prevent workers from doing their jobs with pride must be removed.
8. *Drive out fear.* Because of the tremendous economic losses caused by fear on the job, people must not be afraid to ask questions, to report problems, or to express ideas.
9. *Break down barriers between departments.* Members of the research, design, procurement, sales, and receiving departments must learn about problems with materials and specifications in production and assembly. Each discipline must stop optimising its own work and instead work together as a team for the company as whole. Multidisciplinary quality-control circles can help improve design, service, quality, and costs.
10. *Eliminate numerical goals for the work force.* Targets, slogans, pictures, and posters urging people to increase productivity must be eliminated. Most of the necessary changes are out of workers' control, so such exhortations merely cause resentment. Although workers should not be given numerical goals, the company itself must have a goal: never-ending improvement.
11. *Eliminate work standards and numerical quotas.* Quotas focus on quantity, not quality. Therefore, work standards practically guarantee poor quality and high costs. Work standards that state percentage-defective or scrap goals normally reach those targets but never exceed them.. Piece work is even worse, for it pays people for building defective units. But if someone's pay is docked for defective units, that is unfair, for the worker did not create the defects.
12. *Remove barriers that hinder the workers.* Any barrier that hinders pride in work must be removed, including not knowing what good work is, supervisors motivated by quotas, off-gauge parts and material, and no response to reports of out-of-order machines.
13. *Institute a vigorous program of education and training.* Because quality and productivity improvement change the number of people in some areas and the jobs required, people must be continually trained and retrained. All training must include basic statistical techniques.
14. *Create a structure in top management*

that will push every day on the above 13 points.

Also in support of the above ideas, Juran came up with what he termed 'The Breakthrough Sequence' which is in a 7-point form as follows: [again as summarised by Artemis March]:

Juran's Breakthrough Sequence:-

1. Breakthrough in attitudes. Managers must first prove that a breakthrough is needed and then create a climate conducive to change. To demonstrate need, data must be collected to show the extent of the problem; the data most convincing to top management are usually cost-of-quality figures. To get the resources required for improvement, expected benefits can be monetised and presented in terms of return on investment.
2. Identify the vital few projects. Pareto analysis is used to distinguish the vital few projects from the trivial many and to set priorities based on problem frequency.
3. Organised for breakthrough in knowledge. Two organisational entities should be established—a steering group and diagnosis group. The steering group, composed of people from several departments, defines the program, suggests possible problem causes, gives the authority to experiment, helps overcome resistance to change, and implements the solution. The diagnosis group, composed of quality professionals and sometimes line managers, is responsible for analysing the problem.
4. Conduct the analysis. The diagnosis group studies symptoms, develops hypotheses, and experiments to find the problem's true causes. It also tries to determine whether the defects are primarily operator controllable or management controllable. (A defect is operator controllable only if it meets three criteria: operators know what they are supposed to do, have the data to understand what they are actually doing, and are able to regulate their own performance). Theories can be tested by using past data and current production data and by conducting experiments. With this information, the diagnosis group then proposes solutions to the problem.
5. Determine how to overcome resistance to change. The need for change must be established in terms that are important to the key people involved. Logical arguments alone are insufficient. Participation is therefore required in both the technical and social aspects of change.
6. Institute the change. Departments that must take corrective action must be convinced to co-operate. Presentations to these departments should include the size of the problem, alternative solutions, the cost of recommended changes, expected benefits, and efforts taken to anticipate the change's impact on employees. Time for reflection may be needed, and adequate training is essential.
7. Institute controls. Controls must be set up to monitor the solution and see that it works and to keep abreast of unforeseen developments. Formal follow-up is provided by the control sequence used to monitor and correct sporadic problems.

Characteristics of TQM

A typical TQM system is expected to depict the following characteristics:-

a) Customer satisfaction is the primary goal and ultimate measure of quality in an organisation.

b) The definition of 'customer' is broadened to include both those internal to the organisation (for example, employees in other departments). and those external to the organisation (vendors, taxpayers, contractors, regulators, and suppliers).

c) Everyone must share a common vision of the mission of the organisation based on extended customer requirements.

d) Senior elected and appointed leaders must communicate a long-term commitment to all customers, reward teamwork, and encourage process improvement efforts at all levels.
e) Expended training and self-improvement opportunities in leadership skills must be offered to meet or exceed valid customer requirements.
f) Individual involvement must be ensured by introducing quality circles and quality improvement teams.
g) Employee loyalty, trust, and team participation must be recognised, supported and acknowledged.
h) Fear of change must be eliminated, and other barriers to the development of pride in service must be removed.
i) Everyone must be provided with the tools and training needed to function in accordance with extended customer requirements.
j) Top management must make the necessary changes in the organisation for successful implementation of the preceeding goals to become possible.

The benefits of Total Quality Management

Clearly having gone through the above literature, there is no doubt that an organisation which introduces TQM into its operations system, should gain numerous benefits. TQM studies have revealed that those organisations with TQM particularly in Japan and Western Countries have reported enormous benefits including the following:-

- Quality is raised, and the number of defective products decreases.
- Quality becomes more uniform and the number of complaints decreases.
- Reliability increases, confidence in the products improves and customers' trust is obtained.
- Costs decrease.
- A quality assurance system is established, and the trust of consumers and customers is obtained.
- Complaints are dealt with more quickly, and effective action is taken to prevent their recurrence.
- Unit costs are reduced (and/or are improved), and value-added productivity increases.
- Production volumes increase, and it becomes possible to prepare rational production plans.
- Wasteful work disappears, rework decreases and efficiency improves.
- Technology is established, engineers can be employed in their true capacity, and technology improves. Ways of employing people, particularly engineers, become more rational.
- Inspection and testing costs decrease.
- Contracts with suppliers, subcontractors, and consumers can be rationalised.
- Sales routes expand.
- Relationships and the flow of information within the company organisation become smoother.
- Research and development is speeded up and made more effective.
- Research investment becomes more rational.
- Employees' humanity, personnel development becomes possible, and workplaces become more cheerful.
- Talent-spotting becomes possible. There is encouragement of each individual's personal improvement, innovation and creativity.
- Human relations improve, and barriers between departments are broken down.
- People begin to speak a common language and to understand each other better.
- The whole of the company organisation can be rationalised, and the department managers, section managers, supervisors, and foremen become able to work more effectively.
- Good market information is received more quickly.
- New product development speeds up and

improves. Products for world-beating quality can be made.
- People become able to talk frankly and openly.
- Meetings go more smoothly.
- Plant and equipment repair and expansion can be done rationally according to priority.
- The entire company works together, and a system of Co-operation is established.
- Decision making is speeded up, and policy deployment and management by objectives improves.
- The corporate culture is improved.
- The company becomes trusted.
- The departments understand the idea of dispersion and become able to utilise TQM techniques.
- The company and its factories cease to issue false data.

When closely studied, it is quite easy to notice that the TQM system will undoubtedly benefit almost all the parties involved in the operations and/or affairs of the organisation (for example, employees, top management, middle management, customers, suppliers, contractors, shareholders, and other external agencies, e.g. government departments). It really pays to have a TQM system instituted in the organisation—and the sooner the better.

The implementation program

Having agreed to have TQM instituted into an organisation's operational processes, it is now opportune to have an implementation program which will highlight guiding principles to be followed during implementation of TQM. Many advocates (such as B.G. Dale) of TQM have suggested that, in order to ensure some chance of success for the program, an organisation is advised to establish a "TQM Steering Committee" or a "Quality Council". The duties of the Committee or Council will probably include:-

- Agree plans and goals, provide and manage resources.
- Monitor and review the progress of improvements.
- Determine actions.
- Create an environment which is conducive to quality improvement.
- Find ways of overcoming barriers which are likely to be accountered.
- Facilitate teamwork.
- Concur on issues of quality improvement; and
- Ensure that firm foundations are laid down.

Because of the importance and sensitivity of the TQM Committee or Council, it is advisable to have the Chief Executive as its chairman and the membership should include senior and middle management and trade union representatives. In order to ensure smooth implementation of TQM program, an organisation may adopt Philip Crosby's 14-point Implementations Program as detailed hereunder:-

1. *Management Commitment.* Top management must become convinced of the need for quality improvement and must make its commitment clear to the entire company. This should be accompanied by a written quality policy, stating that each person is expected to "perform exactly like the requirement, or cause the requirement to be officially changed to what we and the customers really need."
2. *Quality Improvement Team.* Management must form a team of department heads (or those who can speak for their departments) to oversee quality improvement. The team's role is to see that needed actions taker place in its departments and in the company as a whole.
3. *Quality Measurement.* Quality measures that are appropriate to every activity must be established to identify areas needing improvement. In accounting, for example, one measure might be the percentage of late reports; in engineering, the accuracy of drawings; in purchasing, rejections due to incomplete descriptions; and in plant

engineering, time lost because of equipment failures.

4. *Cost of Quality Evaluation.* The controller's office should make an estimate of the costs of quality to identify areas where quality improvement would be profitable.
5. *Quality Awareness.* Quality awareness must be raised among employees. They must understand the importance of product conformance and the cost of non conformance. These messages should be carried by supervisors (after they have been trained) and through such media as films, booklets, and posters.
6. *Corrective Action.* Opportunities for correction are generated by Steps 3 and 4, as well as by discussions among employees. These ideas should be brought to the supervisory level and resolved there, if possible. They should be pushed up further if that is necessary to get action.
7. *Zero Defects Planning.* An ad hoc zero defects committee should be formed from members of the quality improvement team. This committee should start planning a zero defects program appropriate to the company and its culture.
8. *Supervisor Training.* Early in the process, all levels of management must be trained to implement their part of the quality improvement program.
9. *Zero Defects day.* A Zero Defects Day should be scheduled to signal to employees that the company has a new performance standard.
10. *Goal Setting.* To turn commitments into action, individuals must establish improvement goals for themselves and their groups. Supervisors should meet with their people and ask them to set goals that are specific and measurable. Goal lines should be posted in each area and meetings held to discuss progress.
11. *Error Cause Removal.* Employees should be encouraged to inform management of any problems that prevent them from performing error-free work. Employees need not do anything about these problems themselves; they should simply report them. Reported problems must then be acknowledged by management within 24 hours.
12. *Recognition.* Public, non financial appreciation must be given to those who meet their quality goals or perform outstandingly.
13. *Quality Councils.* Quality professionals and team chairpersons should meet regularly to share experiences, problems, and ideas.
14. *Do It All Over Again.* To emphasise the never-ending process of quality improvement, the program (Steps 1-13) must be repeated. This renews the commitment of old employees and brings new ones into the process.

Crosby's 14-Point Program is part of the 'gurus' theories, principles and teachings which have been used as a benchmark to determine organisational strengths and weaknesses. TQM advocates, such as J. A. Edosomwan (CEO of Johnson & Johnson) have emphatically said, "The tools and techniques recommended by the gurus can be effective in improving performances of systems, people and work processes which result in improved profitability, market share, and employee satisfaction".

Recommendations

Tanzanian business organisations [and all those concerned] are advised to consider seriously the following recommendations:-

1. National Leaders, Chief Executives including those in managerial positions must pioneer the task of introducing and implementing TQM. They must be fully committed.
2. The Tanzania Bureau of Standards Act, 1975 [as amended] should be revisited and reviewed to ensure that TBS is made to address its objectives towards continuous quality improvement.
3. The Government should strengthen and support the Tanzania Consumers

Protection Association. The public must also be well informed about this Association.

4. The Presidential Directive on Workers Councils [1971] must be reviewed in order to emphasise the need for the Councils to discuss quality improvement in their organisations as the first important issue ..... instead of concentrating mostly on discussing only the budget.
5. Quality Excellency Awards: Should be introduced as soon as possible at national level and in every industry.
6. Every organisation must strive to be a leader in quality improvement. And because seminars and short courses can be among the best ways of educating the employees, TQM training courses/ seminars should be included in the master budgets of the firms.
7. The Board of External Trade should be strengthened and advised to establish a Total Quality Management department.
8. Warranties and Guarantees are an essential ingredient in instilling confidence in consumers. Firms/ Companies which give guarantees will have to ensure that the quality of their products is unquestionable.
9. Tanzanian Higher Learning Institutions should appreciate the relevance and need for TQM in Tanzania today. The syllabi in these institutions should include TQM - either as a separate subject or as a major topic in a management subject
10. The government should reconsider its decision in categorising some parastatal organisations as "sensitive institutions" in which case such organisations have maintained monopoly in supplying/ providing some products or services. This move has perpetuated inefficiency and very poor quality of products or services. The so called sensitive organizations are a severe headache to the public!! The ongoing privatisation exercise should therefore be encouraged and fully supported.

Conclusion

Until perhaps 5-10 years ago Tanzania's manufacturers and, or producers of various products or services had little concern [if any] with regard to the satisfaction of their customers. Following the governments policy to privatise most parastatals and allow commercial competition, the situation is very fast changing. The customer has become a very important player in trade both locally and internationally. In order to secure markets, customers' requirements have first to be identified, defined, and clarified. Quality, therefore, has become the most central issue if firms need to survive, succeed and in the end make profit. It should be born in mind however, that up to now many organisations in Tanzania, particularly parastatal organisations, have not sufficiently emphasised the importance and need of quality. And because of this serious [gap] in management thinking, that is why there are perpetual complaints by consumers about poor quality services and poor quality products. Research suggests that if you want to witness the beginning of the end of your organisation's success and survival, simply ignore quality!!

Bibliography

Crosby, Philip B., Quality Is Free: The Art of Making Quality Certain *[McGraw-Hill Book Company New York [1979]*

Juran, M. Joseph, Juran's Quality Control Handbook *[New York: Mcgraw Hill] [1974]*

Deming W. Edwards, Quality, Productivity, and Competitive Position. [Cambridge [Mass.] *Massachuetts Institute of Technology, Centre for Advanced Engineering Study] [1982]*

Barrie G. Dale & , Introducing TQM: The Role of Senior Cary L. Cooper Management *[Management Decision, Vol. 32 No. 1,* 1994]

Milakovich, Michael E., Total Quality Management For Public Sector Productivity Improvement *[Public Productivity & Management Review Vol. XIV. No. 1 [1990]*

Hyde, Albert C., The Proverbs of Total Quality Management: Recharting the Path to Quality Improvement in the Public Sector. *[Public Productivity & Management Review Vol. XVI No. 1 [1992]*

Ishikawa, Kaoru, Guide to Quality Control. *[Asian Productivity organisation] [1976].*

Wilkinson, Adrian & Fitness For Use? Barriers to Full TQM in the U.K. *[Management Decision, Vol. 29 No.8, 1991].*

Goh, P.L. & Ridgeway, K., The Implementation of Total Quality Management In Small And Medium-sized Manufacturing Companies. *[The TQM Magazine, Vol. 6 No.2, 1994]*

Edosomwan, Johnson, A., Implementation of Strategies For Quality Programs. *[Industrial Engineering - oct. 1992]*

Ross, Joel E., Total Quality Management: Text, Cases and Readings *[St. Lucie Press - 1995].*

The Tanzania Bureau of Standards Act 1975.