Abstract. This article aims to give fundamentals to the Total Quality Management Model introduced in John S. Oakland's book "Total Quality Management – The route to improving performance". The basic idea in the model is to adopt a process based on customer-supplier interfaces (quality chains). This sensitive core must be surrounded by commitment to quality (meeting the customer requirements), communication of the quality message, and recognition of the need to change the culture of most organizations to create total quality. The successful implementation of these soft foundations needs the hard management necessities added: Quality System, Teams and Tools.

1. Introduction

“What is quality management?” Something that is best left to the experts is often answer to this question. But this is avoiding the issue, because it allows executives and managers to opt out. Quality is too important to leave to the so called ‘quality professionals’; it cannot be achieved on a company-wide basis if it is left to experts. Equally dangerous, however, are the uninformed who try to follow their natural instincts because they ‘know what the quality is when they see it’. This type of intuitive approach will lead to serious attitude problems, which do no more than reflect the understanding and knowledge of quality that are presented in an organization. [01]

The idea behind the Oaklands’ Total Quality Management (TQM) is to evolve organizations’ traditional Quality Control to Quality Management, which is far more than shifting the responsibility of detection of problems from the customer to the producer. It requires a comprehensive approach that must first be recognized and then implemented if the rewards are to be realized. TQM is an approach to improving the competitiveness, effectiveness and flexibility of a whole organization.

This paper presents Oaklands’ model for TQM: the versatile approach to the methods and techniques used in TQM. They can be applied throughout many business areas (e.g. manufacturing, health care, education, industry). The approach focuses on developing a problem-prevention mentality: not techniques to measure quality afterwards, but rather techniques to improve the production process itself.

The Model is partly based on earlier findings of “Three American Gurus”: [02]

- Philip B Crosby, who has four absolutes of quality (Definition, System, Performance Standard and Measurement). He offers 14 steps to quality improvement (Management Commitment, Quality Improvement Teams, Determine Problems, Evaluate Costs, Raise the Quality Awareness, Correct Problems, Zero Defects Programme, Train Supervisors, Inform Employees of Changes, Encourage Individuals, Encourage Communication, Recognize and Appreciate, Quality Councils, Do It All Over Again)
• *W Edwards Deming*, who has fourteen points for management (Constancy of Purpose towards Improvement, New Philosophy, Statistics, Price Tag, Find Problems, Training, Quality Training for Supervision, Drive Out Fear, Break Down Barriers between Departments, Eliminate Numerical Goals, Eliminate Numerical Quotas, Remove Barriers between Work Groups, Education Program, Push Every Day above 13 points)
• *Joseph M Juran*, who has ten steps to quality improvement (Needs, Goals, Organize, Train, Solve Problems, Report Progress, Recognition, Communicate, Score, Maintain)

2. Background

John S. Oakland: Exxon Chemical Professor of Total Quality Management Centre for TQM, Management Centre, University of Bradford.

When Oakland wrote first edition of this book in 1988, there were very few books on the subject of Total Quality Management. Since its publication, the interest in TQM and business process improvement has exploded. There are now many texts on the subject and its various aspects.

This edition is based on the first, but its structure and content have changed substantially to reflect the developments, current understanding, and experience gained of TQM.

2.1. Quality Experts own experience

It seems that John S. Oakland has wide experience in real projects. He refers to many examples in various business areas; like telling the story of two men who worked as Production Manager and Quality Control Manager and almost fight when trying to agree if the material is suitable for despatch to the customer. The problem there was trying to answer the question: ‘Have we done the job correctly?’, when the correct question to ask would have been: ‘Are we capable of doing the job correctly?’. Another story tells about a company selling wooden products with a very simple purchasing policy: they buy the cheapest wood they can find in the world! Quite an obvious result is cracking, splits, warping, etc in the end products (window and door frames). Still, Purchasing Manager refuses for any changes until it is proven to him that the loss for the year examined was £1 million in scrap and rework. [03]

John S. Oakland has written the first edition of Total Quality Management book already in 1988, and based on his experiences in European Centre for TQM and in Quality Management Consultants Ltd, he found it necessary to rewrite it after 4–5 years. Now he finds Total Quality Management as a “comprehensive approach, that has been used successfully in many organizations throughout the world”. His experience is compressed as a model for TQM. The model is based on customer-supplier interfaces and the fact, that there lies a number of processes. More detailed descriptions will follow in later chapters of this paper.

2.2. Context of the book

*Total Quality Management*-book is about how to manage in a total quality way. It is structured in around five parts of a model for TQM:
• The Foundations – A Model for TQM
• TQM – The Role of the Quality System
In these 5 parts the book first gives the sensitive core, how it must be surrounded by commitment, followed with communication and a cultural change of the organization and then the systems, tools and teams – the hard management necessities. The most practical parts are The Tools and The Implementation.

2.3. Evolution of the ideas

According to John S. Oakland many of the ‘gurus’ appear to present different theories of quality management. In reality they are talking all the same ‘language’ but they use different dialects. The basic principles of defining quality and taking it into account throughout all the activities of the business are common. Quality has to be managed, it does not just happen. Understanding and commitment by senior management, effective leadership and teamwork are fundamental parts of the recipe for success.

The basic idea evolved in this book is the model to change Quality Assurance to Quality Control: the control of quality can take place at the point of operation or production – e.g. where the item is manufactured. The act of inspection is not quality control.

When the question: ‘Have we done the job correctly?’ is given indirectly by answering the questions of capability and control, then we assured quality, and the activity of checking becomes one of quality assurance – making sure that the product or service represents the output from an effective system to ensure capability and control. It is frequently found that organizational barriers between departmental empires encourage the development of testing and checking of services or products in a vacuum, without interaction with other departments.

Quality Control is essentially the activities and techniques employed to achieve and maintain the quality of a product, process, or service. It includes monitoring activity, but is also concerned with finding and eliminating causes of quality problems so that the requirements of the customer are continually met.

2.4. Cultural and historical aspects

Not too long ago the Japanese companies were most famous for ‘cheap oriental trash’. They clearly have learned something. This has not as much to do with differences in national cultures, as one could think it has. The Japanese culture, which is much older than most western cultures, has not changed significantly in 40-50 years. One of the lessons many Japanese companies learned after the Second World War was to manage quality, and the other things on which we compete. They learned it from a handful of Americans – people like Joseph M. Juran and W. Edwards Deming, who have since reached fame as ‘gurus’ of quality management. [04]

Most TQM approaches strongly emphasize measurement, especially in the quality assurance and control areas. The recognition that TQM is a broad culture change vehicle with internal and external focus embracing behavioural and service issues, as well as quality assurance and process control, prompted the United States to develop one of the most famous and now widely used frameworks for TQM – the Malcolm Baldridge National Quality Award (MBNQA). The award itself is presented annually to recognize companies in the USA that have ‘excelled in quality management and quality achievement’. But it is not the award itself, or even the fact it is presented each year by the President of US. It is
the excellent framework, which is one of the closest things we have to an international standard for TQM.

The value of a structured discipline using a points scoring system has been well established in quality and safety assurance systems (for example, ISO 9000). The extension of this approach to a total quality auditing process has been long established in the Japanese-based ‘Deming Prize’, which is perhaps the most demanding and intrusive auditing process. There are other excellent models and standards used throughout the world. The British Standard BS7850 Guide to TQM and British Quality Award and the European Quality Award. [05]

Culture in any business may be defined as beliefs that pervade the organization about how business should be conducted and how employees should behave and should be treated. The only efficient way to tackle process improvement or complex problems is through teamwork. The team approach allows individuals and organizations to grow. Employees will not engage continual improvement without commitment from the top, a quality climate and an effective mechanism for capturing individual contributions.

Quality improvement needs culture change through teamwork. Some American and Japanese quality ‘gurus’ have each set of down a number of points and absolutes. Words of wisdom in management and leadership and many organizations are using these to establish a policy based on quality. They can be summarised as follows:

- Identify customer-supplier relationships
- Manage processes
- Change the culture
- Improve communication
- Show commitment

There would be however a major conflict between trying to create a total quality culture and trying to maintain a payment structure that was focused strongly on motivating individuals to maximize their output volume. The benefits of TQM come not from meeting a predetermined quality organization, but from a culture in which the efforts of everyone in the organization are directed towards never-ending improvements in the delivery of the customers’ requirements.

3. Concepts

*Quality* is used to signify “excellence” of a product or service. In some engineering companies the word may be used to indicate that a piece of metal conforms to certain physical dimension characteristics often set down in the form of a particularly “tight” specification. In a hospital it might be used to indicate some sort of “professionalism”. If we are to define quality in a way that is useful in its management, then we must recognize the need to include in the assessment of quality the true requirements of the customer – the needs and expectations. Quality has to be managed – it does not just happen.

Oakland summaries quality definitions based on the ways it has been expressed by other authors: [07]

- “Fitness for purpose or use” – Juran
- “The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs” – BS 4778, Quality Vocabulary
• “Quality should be aimed at the needs of the customer, present and future” – Deming
• “The total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectation by the customer” – Feigenbaum
• “Conformance to requirements” – Crosby

If quality is meeting the customer requirements, then this has wide implications. The requirements may include availability, delivery, reliability, maintainability and cost-effectiveness, among many other features. Part of the acceptability of a product or service will depend on its ability to function satisfactorily over a period time and it is this aspect of performance that is given the name reliability. It is the ability of the product or service to continue to meet the customer requirements. [08]

The reputation enjoyed by an organization is built by quality, reliability, delivery and price. Quality is the most important of these competitive weapons.

The concept of Total Quality Management (TQM) is basically very simple. Each part of an organization has customers, and the need to identify what the customer requirements are and then set about meeting them, forms the core of a total quality approach: processes and supplier-customer interfaces. It requires the three hard management necessities: Quality System, Tools and Teamwork. These management necessities are in collaboration with Culture, Communication and Commitment.

Quality Chains are formed of the supplier and customer interfaces. Throughout all organizations there are a series of internal suppliers and customers, which then build ‘chains’. These form the so-called Quality Chains, the core of company-wide quality improvement (CWQI). The internal customer/supplier relationships must be managed by interrogation, i.e. using a set of questions at every interface. Measurement of capability is vital.

Process is “the transformation of a set of inputs, which can include actions, methods, and operations into outputs, that satisfy customer needs and expectations, in the form of products, information, services or – generally- results”. [page 14]

This definition means that the processes are handled in a ‘black-box’ way; even methods and procedures are inputs, not aspects of the process internals. Processes have anyhow important role: “At every supplier-customer interface there resides a transformation process and every single task throughout an organization must be viewed as a process in this way”.

Quality systems should apply to and interact with all activities of the organization. The activities are generally processing, communicating and controlling. These should be documented in the form of a quality manual. Quality system should follow the PLAN DO CHECK ACT cycle, through documentation, implementation, audit and review. The cycle of PLAN DO CHECK ACT is a useful design aid for measurement systems, but firstly four basic questions about measurement should be asked, i.e. WHY, WHAT, WHERE and HOW. In answering the question “how to measure?” progress is important in five main areas: effectiveness, efficiency, productivity, quality and impact. [09]

A quality plan is a part of the Quality System and sets out details for systems, procedures, purchased materials or services, products/services, plant/equipment, process control, sampling/inspection, training, packaging and distribution.

Tools cover techniques for measurement, metrics and improvements.

Teamwork is defined as an effective cultural change because it provides an essential component of the implementation of TQM.

Culture is defined as the beliefs that pervade the organization about how business should be conducted and how employees should behave and should be treated.
Communication is seen as a powerful way for influencing attitudes and behaviour. TQM will significantly change the way many organizations operate and it will require direct and clear communication from the top management to all staff. Everyone will need to know their roles in understanding processes and improving their performance. [page 365]

Commitment is connected to leadership and is the first step after understanding quality in Implementation of TQM. The main point in getting people committed is to ensure all know what is going on.

4. Contribution

Total Quality Management is represented as a model: The core of the model is the customer (both externally and internally) - supplier interfaces. Management necessities (teams, tools and system) are represented in the surrounding triangle; the outer shell consists of culture, communication and commitment. The model acts as a framework, which leads the organization towards TQM. [06]

![Figure 1. Total quality management model](image)

4.1 Quality system

Quality system is the driving force for quality improvements and is presented as a rolling drum, where the continuity of improvements is combined to Deming’s Cycle: Plan–Do–Check–Act. First step is to find out where the organization stands now, write down what is currently done and justify the system to meet the requirements of a good international standard, like ISO 9001, etc. Organization should prepare a quality plan and a quality manual.

A quality plan is a document which is specific to each product, activity or service that sets out the necessary quality-related activities. The plan should include to any: [10]

- Purchased material or service specifications
4.2. Seven new tools for quality design

This book presents seven new tools for quality design. Seven new tools may be used as part of quality function deployment to improve the innovation processes. These are systems and documentation methods for identifying objectives and intermediate steps in the finest detail. The promotion and use of the tools by the quality function deployment (QFD) team should obtain better designs in less time. They are summarized below. [11]

![Diagram of seven new tools for quality design]

**Figure 2. The seven new tools of quality design**

**Affinity diagram** is used to gather large amounts of language data and organizes them into groupings based on the natural relationship between the items. In other words, it is a form of brainstorming.
One of the obstacles often encountered in the quest for improvement is past success or failure. It is assumed that what worked or failed in the past will continue to do so in the future. Although the lessons of the past should not be ignored, unvarying patterns of thought, which can limit progress, should not be enforced. This is especially true in QFD, where new logical patterns should always be explored.

The affinity diagram, like other brainstorming methods, is part of the creative process. It can be used to generate ideas and categories that can be used later with more strict, logic-based tools.

The affinity diagram is not recommended when a problem is simple or requires a very quick solutions.

**Interrelationship digraph** is a tool designed to take a central idea, issue or problem, and map out the logical or sequential links among related factors. While this still requires a very creative process, the interrelationship digraph begins to draw the logical connections that surface in the affinity diagram. In designing, planning, and problem solving it is obviously not enough to just create an explosion of ideas. The affinity diagram allows some organized creative patterns to emerge but the interrelationship digraph lets logical patterns become apparent.

The interrelationship digraph is adaptable to both specific operational issues and general organizational questions. For example, a classic use of this tool at Toyota focused on all the factors behind the establishment of a 'billboard system' as part of their JIT programme. On the other hand, it has also been used to deal with issues underlying the problem of getting top management support for TQM.

The interrelationship digraph can be used by itself, or it can be used after the affinity diagram, using data from the previous effort as input.

**System flow/tree diagram** (usually referred to as a tree diagram) is used to systematically map out the full range of activities that must be accomplished in order to reach a desired goal. It may also be used to identify all the factors contributing to a problem under consideration.

As mentioned above, major factors identified by an interrelationship digraph can be used as inputs for a tree diagram. One of the strengths of this method is that it forces the user to examine the logical and chronological link between tasks. This assists in preventing a natural tendency to jump directly from goal or problem statement to solution (Ready … Fire … Aim!)

The tree diagram is indispensable when a thorough understanding of what needs to be accomplished is required, together with how it is to be achieved, and the relationships between these goals and methodologies.

The purpose of the **matrix diagram** is to outline the interrelationship and correlations between tasks, functions or characteristics, and to show their relative importance. There are many versions of the matrix diagram, but the most widely used is a simple L-shaped matrix known as the quality table.

In the L-shape two interrelated groups of items are presented in line and row format. It is a simple two-dimensional representation that shows the intersection of related pairs of items. It can be used to display relationships between items in all operational areas, including administration, manufacturing, personnel, R&D etc., to identify all the organizational tasks that need to be accomplished and how they should be allocated to individuals. In a QFD it is even more interesting if each person completes the matrix individually and then compares the coding with everyone in the work group.

**Matrix data analysis** is used to take data displayed in a matrix and arrange them so that they can be more easily viewed and show the strength of the relationship between variables. It is used most often in marketing and product research. The concept
behind matrix data analysis is fairly simple, but its execution (including data gathering) is complex.

A good idea of the uses and value of the construction of a chart for matrix data analysis may be shown in a simple example in which types of pain relievers are compared based on gentleness and effectiveness. This information could be used together with some type of demographic analysis to develop a marketing plan. Based on the information, advertising and product introduction could be effectively tailored for specific areas. New product development could also be carried out to attack specific niches in markets that would be profitable.

![Pain relievers chart]

**Figure 3.** An simple example of matrix data analysis

A **process decision programme chart** (PDPC) is used to map out each event and contingency that can occur when progressing from a problem statement to its solution. The PDPC is used to anticipate the unexpected and plan for it. It includes plans for countermeasures on deviations. The PDPC is related to a failure mode and effect analysis and its structure is similar to that for a tree diagram.

The PDPC is very simply an attempt to be proactive in the analysis of failure and to construct, on a paper, a 'dry run' of the process so that the 'check' part of the improvement cycle can be defined in advance. PDPC is likely to enjoy widespread use because of increasing attention to product liability.

The **arrow diagram** is used to plan or schedule a task. To use it, one must know the sub-task sequence and duration. This tool is essentially the same as the standard Gantt chart. Although it is a simple and well known tool for planning work, it is surprising how often it is ignored. The arrow diagram is useful in analysing a repetitive job in order to make it more efficient. Some suggestions on constructing arrow diagrams are:

- Use a team of people working on a job or project e.g. a QFD team, to list all the tasks necessary to complete the job, and write them on individual cards. On the bottom half of the card, write the time required to complete the task.
- Place related tasks together. Place them in chronological order.

### 4.3. Tools and techniques for quality improvement

A **systematic approach**

Numbers and information will form the basis for understanding, decisions, and actions in never ending improvement.
A set of simple tools is needed to interpret fully and derive maximum use from data. More sophisticated techniques may need to be employed occasionally. The effective use of the tools requires the commitment of the people who work on the process. This in turn needs management support and the provision training.

**Some basic tools and techniques**

The tools and the questions answered are:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process flow charting</td>
<td>- what is done?</td>
</tr>
<tr>
<td>Check / tally charts</td>
<td>- how often is it done?</td>
</tr>
<tr>
<td>Histograms</td>
<td>- what do variations look like?</td>
</tr>
<tr>
<td>Scatter diagrams</td>
<td>- what are the relationships between factors?</td>
</tr>
<tr>
<td>Stratification</td>
<td>- how is the data made up?</td>
</tr>
<tr>
<td>Pareto analysis</td>
<td>- which are the big problems?</td>
</tr>
<tr>
<td>Cause and effect analysis</td>
<td>- what causes the problem?</td>
</tr>
<tr>
<td>And brainstorming</td>
<td></td>
</tr>
<tr>
<td>Force-field analysis</td>
<td>- what will obstruct or help the change solution</td>
</tr>
<tr>
<td>Emphasis curve</td>
<td>- which are the most important factors?</td>
</tr>
<tr>
<td>Control charts (include cusum)</td>
<td>- which variations to control and how?</td>
</tr>
</tbody>
</table>

**Failure mode, effect and criticality analysis (FMECA)**

FMECA is the study of potential product, service, or process failures and their effects. When the results are ranked in order of criticality, the technique is called FMECA. Its aim is to reduce the probability of failure. [12]

The elements of a complete FMECA are to study failure mode, effect, and critically. It may be applied at any stage of design, development, production / operation, or use. Moments of truth (MoT) is a similar concept to FMEA. It is the moment in time when a customer first comes into contact with an organization, leading to a judgement about quality.

**Statistical process control (SPC)**

People operating a process must know whether it is capable of meeting the requirements, know whether it is actually doing so at any time, and make correct adjustments when it is not. SPC techniques will help here. [13]

Before using SPC, it is necessary to identify what the process is, what the inputs / outputs are, and how the suppliers and customers and their requirements are defined. The most difficult areas for this can be in non-manufacturing.

All process can be monitored and brought 'under control' by gathering and using data. SPC methods, with management commitment, provide objective means of controlling quality in any transformation process.

SPC is not only a toolkit, it is a strategy for reducing variability, part of never ending improvement. This is achieved by answering the following questions:

- Are we capable of doing the job correctly?
- Do we continue to do the job correctly?
- Have we done the job correctly?
- Could we do the job more consistently and a target?

This provides knowledge of process capability.
The impact of a quality system and SPC together is the gradual reduction of the variability in the ways things are done.

**Quality improvement techniques in non-manufacturing**

SPC techniques have value in the service sector and in the non-manufacturing areas, such as marketing and sales, purchasing, invoicing, finance, distribution, training and personnel.

**Adding the tool to the TQM model**

A second hard management necessity - the tools - be added, with the system, to the TQM model to progress further round the never-ending improvement cycle.

4.4 **The Organizational, Communication and Teamwork Requirements**

Not any documented system may give the quality improvement, it lies with the person or group actually doing the job. Positive quality policy starts with the senior management and spreads all over the organization and must have the commitment of all employees. Responsibilities should anyhow be very clear and managers be in control only when their subordinates can exercise self-control.

The integration of the business interests of customers and suppliers is the interface where the focus of the quality function should lie. Its role is to encourage and facilitate quality improvement. In larger organizations a quality director will contribute to the prevention strategy. Smaller organizations may appoint a member of the management team to this task on a part-time basis. An external TQM adviser is usually required.

A Quality Council (QC) may establish the systematic approach to continuous improvement. A quality circle is a group of people who do similar work analyzing and solving work related problems and make recommendations to management.

Teamwork has been seen as an important mechanism: “The only efficient way to tackle process improvement or complex problems is through teamwork. The team approach allows individuals and organizations to grow.”

“The team process has inputs and outputs. Good teams have three main attributes: high task fulfillment, high team maintenance and low self-orientation.” Teamwork may mean a change in culture, which must be supported by management through its activities and behaviour. [17]

5. **Critical examination**

5.1 **Logic and structure of the quality thinking**

Oakland's quality define is simply "meeting the customer requirements". He say that this has been expressed in many ways by other authors.

The reputation enjoyed by an organization is built by quality, reliability, delivery and price. Quality is the most important of these competitive weapons. Oakland want define properly word reliability. He say that reliability is the ability of the product or service to continue to meet the customer requirements over time.

Reputations for poor quality last for a long time, and good or bad reputations can become national. The management of quality can be learned and used to improve reputation.
Oakland's quality thinking starts phrase "Quality starts with marketing". He think that marketing establishes the true requirements for the product or service. These must be communicated properly throughout the organization in the form of specifications.

The marketers must of course understand not only the needs of the customer but also the ability of their own organization to meet them. Oakland present an example: If my customer places a requirement on me to run 1,500 metres in 4 minutes, then I know I am unable to meet this demand, unless something is done to improve my running performance. Of course I may never be able to achieve this requirement".

The commitment of all members of an organization is a requirement of company-wide quality improvement. Everyone must work together at every interface to achieve perfection. And that can only happen if the top management is really committed to quality improvement.

All members of an organization need to work together on company-wide quality improvement. The co-operation of everyone at every interface is required to achieve perfection.

To be successful in promoting business efficiency and effectiveness, TQM must be truly organization-wide, and it must start at the top with the Chief Executive or equivalent. The most senior directors and management must all demonstrate that they are serious about quality. The middle management have a particularly important role to play, since they must not only grasp the principles of TQM, they must go on to explain them to the people for whom they are responsible, and ensure that their own commitment is communicated. Only then will TQM spread effectively throughout the organization. This level of management must also ensure that the efforts and achievements of their subordinates obtain the recognition, attention and reward that they deserve.

5.2. Similarities to process thinking

Oakland think that everything we do is a process, which is the transformation of a set of inputs into the desired outputs. A process is the transformation of a set of inputs, which can include actions, methods and operations, into outputs that satisfy customer needs and expectations, in the form of products, information, services or results. [14]

Because everything as we do is a process, so in each area or function of an organization there will be many process taking place. For example, a finance department may be engaged in budgeting processes, accounting processes, salary and wage processes, costing processes, etc. Each process in each department or area can be analysed by an examination of the inputs and outputs. This will determine some of the actions necessary to improve quality. There are also functional processes.

The output from a process is that which is transferred to somewhere or to someone – the customer. Clearly, to produce an output that meets the requirements of the customer, it is necessary to define, monitor and control the inputs to the process, which in turn may be supplied as output from earlier process.

At every supplier-customer interface then there resides a transformation process and every single task throughout an organization must be viewed as a process in this way.
5.3. Critical review of the ideas presented

Oakland does not give any weaknesses about his quality thinking. His own ideas based on three American quality experts (Philip B Crosby, W Edwards Deming, Joseph M Juran) train of thought. His quality defined is actually same than others but he said it different words.

Oakland's own idea is the TQM model. He claims that the vehicle for achieving effective leadership is Total Quality Management. The core of TQM model is the customer-supplier relationship, where the processes must be managed. The 'soft' outcomes of TQM - the culture, communications, and commitment provide the foundation for the TQM model. The process core must be surrounded by 'hard' management necessities of system, tools and teams. The model provides a framework against which an organization's progress towards TQM can be examined.

Oakland present a lot of his own opinion but he does not scientifically prove anything. He claim that quality is the most important competitive weapon but is common property that there are a lot of trades where lower price is the main thing.

6. Conclusions

6.1. Summary of the findings

One of the main findings is to separate quality control and quality assurance. Quality control is essential the activities and techniques employed to achieve and maintain the quality of a product, process or service. Quality assurance is broadly the prevention of quality problems through planned and systematic activities.

Quality Control appears as an evolved TQM Model, which basic levels are

- Customer-supplier interfaces based process in core
Culture, Communication and Commitment shell
Teams, Tools and System management
The core of TQM is the customer-supplier relationship.
Quality must be involved in all functions: It is too important to leave to the so-called ‘quality professionals’.
Throughout and beyond all organizations, whether they be manufacturing concerns, banks, retail stores, universities, hospitals or hotels, there is a series of quality chains of customer and suppliers. That may be broken at any point by one person or one piece of equipment not meeting the requirements of the customer, internal or external. The concept of internal and external customers-suppliers forms the core of total quality. All members of an organization need to work together on company-wide quality improvement. The cooperation of everyone at every interface is required to achieve perfection. [15]
In the successful operation of any process it is essential to understand what determines its performance and outputs. This means intense focus on the design and control of the inputs, working closely with suppliers and understanding process flows to eliminate bottlenecks and reduce waste.
The concept of total quality management is basically very simple. Each part of an organization has customers, whether within or without and the need to identify what the customer requirements are, and then set about meeting them, forms the core a total quality approach. This requires the three hard management necessities: a good quality management system, tools such as statistical process control and teamwork. [16]

6.2. Work group’s comments

The book contains after every chapter good highlights of chapter. That is short and compact chapter where is told all important quite shortly.
The book is quite well organised and it goes on logically from begin to end and contains many good examples.
The ability to meet the customer requirements is vital, not only between two separate organizations, but within the same organization. Reliability is the ability of the product or service to continue to meet the customer requirements over time.
TQM in an organization means that everyone has the determination to use their detailed knowledge of the processes and make improvements.
Always is very important listen to customer. Listen, listen and once again listen what are requirements of customer.

Total Quality Management is a never ending task…
References from Oakland to our summary

[04] Oakland J S, Total Quality Management – The route to improving performance p. 3-10

Other references what we are used on support material