QUALITY MANAGEMENT SYSTEM IN MANUFACTURING INDUSTRIES IN BANGLADESH: A CRITICAL ANALYSIS AND IMPROVEMENT STRATEGIES

A Project Thesis

by

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November, 1998
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A thesis submitted to the department of Industrial & Production Engineering, Bangladesh University of Engineering and Technology, Dhaka in partial fulfilment of the requirements for the degree of Master of Engineering (ME)

November, 1998

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Candidate's Declaration

It is hereby declared that this thesis or any part of it has not been submitted elsewhere for the award of degree or diploma or publication.

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TO
MY PARENTS
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Author
Continuous technological improvement is transferring the global scenario almost dramatically. In the context of free market economy, there has been a rapid growth in trade and international capital flows all over the world. As a member of the World Trade Organization, Bangladesh is now open to the world traders—its local market is also an international market. A manufacturer in Bangladesh is, therefore, to realize that if he wants to stay in business, he must produce quality goods with competitive price. His products must respond and materials and processes must conform to constantly changing needs and expectation of the consumers.

During the last few decades there had been a remarkable transformation of quality function in industries. The conception of age-old statistical method has been complemented by Company-Wide-Quality-Control (CWQC). Many developed and developing countries of the world have been using the modern quality management techniques. But in this respect Bangladesh falls far behind. So to face the challenge of the fierce competition in the present business world, it has to quickly implement modern quality improvement tools.

The present research work conducts a survey through a set of questionnaires the quality management systems of the various industries both in the Large and Medium scale industries (LMI) and Small and
Cottages industries (SCI). It then studies, examines and analyzes their current status and finally suggests specific recommendations.

As regards the industries in the LMI sector, a methodology has been developed for analysis of the existing status. On the basis of the quality management philosophies and conceptual models found in the literature, a set of quality determinants has been identified. Some factors (indicators) have been selected to objectively qualify each determinant. Each qualifying factor is assigned a score. On the basis of the survey findings, scores are assigned to the selected quality determinants of all industries. According to the total scores obtained by different industries, they are classified or ranked. Specific quality improvement strategies on them suggested for each level.

Unlike the LMI sector, no specific scoring method is applied for the SCI sector. In view of the findings of survey work, the quality determinants are studied and examined and accordingly specific recommendations are provided to enhance the quality management systems.
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<td>BSCIC :</td>
<td>Bangladesh Small and Cottage Industries Corporation</td>
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<tr>
<td>BSTI :</td>
<td>Bangladesh Standard and Testing Institution</td>
</tr>
<tr>
<td>CAD :</td>
<td>Computer-Aided Design</td>
</tr>
<tr>
<td>CAM :</td>
<td>Computer-Aided Manufacturing</td>
</tr>
<tr>
<td>CEO :</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CIM :</td>
<td>Computer-Integrated Manufacturing</td>
</tr>
<tr>
<td>CNC :</td>
<td>Computerized Numerical Control</td>
</tr>
<tr>
<td>CWQC :</td>
<td>Company-Wide Quality Control</td>
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<tr>
<td>DOE :</td>
<td>Design of Experiments</td>
</tr>
<tr>
<td>EOQ :</td>
<td>Economic Order Quantity</td>
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<tr>
<td>FMS :</td>
<td>Flexible Manufacturing System</td>
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<td>GDP :</td>
<td>Gross Domestic Product</td>
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<td>ISO :</td>
<td>International Standard Organization</td>
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<td>JIT :</td>
<td>Just-In-Time</td>
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<tr>
<td>LMI :</td>
<td>Large and Medium Scale Industries</td>
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<td>NC :</td>
<td>Numerical Control</td>
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<td>QC :</td>
<td>Quality Control</td>
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<td>QM :</td>
<td>Quality Management</td>
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<td>SCI :</td>
<td>Small &amp; Cottage Industries</td>
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<td>SPC :</td>
<td>Statistical Process Control</td>
</tr>
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<td>TQC :</td>
<td>Total Quality Control</td>
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<td>TQM :</td>
<td>Total Quality Management</td>
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<td>WTO :</td>
<td>World Trade Organization</td>
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Chapter One

INTRODUCTION

1.1 INTRODUCTION

Continuous technological improvement is transferring the global scenario almost dramatically. There is a rapid growth in trade and international capital flows all over the world in the context of free market economy. The classical boundary of a country or a region does not exist; rather it has been broken down and given a new shape. In addition to the significant influence on the economic activities, the free market economy has got the potentiality to go a long way in shaping the political, social and cultural life of people of the earth. In this business arena, if a country could not succeed in framing and implementing appropriate industrial policies quickly, the resultant effect on its overall economy will be frustrating.

As a member of World Trade Organization (WTO), Bangladesh constituting a huge market for consumer products, is now open to the world traders. Thus various products are continuously entering into this market. With the availability of foreign goods, customers' expectations are continuously rising. Due to free market economy, the local market should also be considered as an international market. A manufacturer should realize this important point and should produce quality goods with competitive price. Quality provides customers with products that
consistently meet their needs and expectations. In this age of communication, people are continuously adding to the general store of knowledge, making it possible to accomplish new things based on sharing of new information and discoveries. As a result, the needs and expectations are constantly changing. A manufacturer has to accept this challenge to make something better. Products must respond and materials and processes must conform to these changes. Needless to say, today continuous quality improvement is absolutely necessary just to keep up.

Again, for quality improvement, quality management, which consists of understanding of the techniques, the people and the system, is a must. It produces greater organizational consistency, improves customer satisfaction and reduces the business process costs.

1.2 MODERN CONCEPT OF QUALITY AND ITS MANAGEMENT

Quality is a practice of millions of years. It comes along with the human society from the very beginning. Concept of quality has been being changed with the change of culture, science and technology. Different scientists present a lot of definitions for quality in different times from distinct points of views. In the near past, quality was treated as the conformance to requirements, absence of defects, fitness-for-use etc. But, now, it is treated as the meeting of customers' needs and satisfactions.

Earlier, quality is determined by producers. According to their own design and specifications, the producers manufactured products and tried to sell them to the market. But this fashion is almost obsolete in the present
business world. Customers buy the products according to their requirements, not on the basis of producers' claim. That is, if the product could not meet the true requirement of the customer, the claim of the producer about quality would be meaningless. In this context, modern quality management philosophy says – "Quality is the determination of customers, not of producers, engineers or managers."

In the traditional view it seems that the quality control is the task of QC department only. The department would inspect the products to check whether they are within the specification limits. The products, which conformed to specifications, were delivered to the market, while the rest are reworked and/or discarded as scrap.

Today, the scenario is completely different. In the modern quality control philosophy, quality is "built" into the product keeping customer satisfaction at the front. Customers' satisfaction is pronounced in all stages of the production cycle – from design and development to after sales service. This calls for the active involvement in quality functions on the part of the employees of all departments, thus creating a total quality culture within the organization. This is the essence of total quality control (TQC).

1.3 GLOBAL SCENARIO ABOUT QUALITY

During the last few decades there had been remarkable transformation of quality function in the industry. The conception of age-old statistical
method has been complemented by Company-Wide Quality Control (CWQC). Japanese are implementing the concept CWQC successfully. CWQC means to provide good and low-cost products, dividing the benefit among consumers, employers and stockholders while improving the quality of people's lives. To do so, CWQC philosophy which suggests to improve quality control effectively necessitates the cooperation of all people in the company, involving top management, managers, supervisors and workers in all areas of corporate activities such as market research, research and development, product planning, design, preparations for production, purchasing, vendor management, manufacturing, inspection, sales and after services as well as financial control, personnel administration, and training and education. Through CWQC Japanese companies have taken quality control technology into the humanistic stage to deploy the voice of the customer throughout the company and mobilise all employees to focus on continued quality improvement at lower cost. In contrast, American companies practise Total Quality Control (TQC) concept, which is defined as the system for integrating quality technologies into various functional departments (engineering, production, sales and service) to achieve customer satisfaction. In the US, TQC generally refers to the quality of product and service. It does not focus on human development.

In Japan, TQC is actually a subset of CWQC. It covers the first three of seven stages of quality development as shown in Figure-1[1].
It is found that US companies emphasize on problem solving. For this reason, they focus their attention to improve the production process. They do not use their efforts for design and human resource development. In contrast, Japanese companies put emphasis in quality from the very beginning of the production cycle. Through the development of design, production process and human research, they use minimum capital/efforts for problem solving in the later stage.

The developed countries aim at both producing quality products at lower costs and satisfying their customers. For this, they are adopting various techniques. For example, they use various powerful statistical methods. Design of Experiments (DOE) is applied in the 'pre-production stage' for
the search of variables responsible for the variations. During production, they use SPC tools to keep the process under control. Besides, QC circle activities, QC audit system etc have been implemented in each company. They emphasize more on training and education. They hold the view that QC starts from education and ends with education.

Not only Japan or USA uses the modern quality management concepts but also many others developed and developing countries of the world use them. Many Asian countries are trying to change their position by implementing proper quality management techniques in both manufacturing and service organizations. In this regard: Singapore, South Korea, China, Malaysia are worth mentioning. India is also coming to this track rapidly.

In the context of free market economy, another important issue ISO standard has come in the front line. Gradually ISO certification is being the vital criteria for an organization to compete in the international market, especially in European and American markets. So, the organizations of the world are trying to adopt ISO standards to achieve proper recognition in the present business world.
1.4 SCENARIO OF BANGLADESH ABOUT QUALITY MANAGEMENT

The overall scenario of Bangladesh about quality management system is not encouraging. In the race of 'quality management effort' to face the challenge of the fierce competition in the business world, Bangladesh falls far behind.

The primary target of most of the industries in Bangladesh is quick return on investment. Long term planning is almost absent. A significant number of enterprises including government organizations believe that quality improvement is a wasteful effort, which reduces company's profitability. That is why top management emphasizes more on production volume, least on product quality.

For most of the organizations, people at the top management, though experienced, are not exposed to the modern quality management techniques. Naturally they are less committed to the quality improvement activities. They are not interested to provide education and training to their employees. So the overall quality level cannot improve.

Most of enterprises in Bangladesh are characterized by their autocratic management styles. There is least participation of the lower level employees in any decision making process. In most of the time their good ideas on quality and productivity improvement are also not well
considered. Under such environment, QC circle activities, which are prerequisite for quality improvement, cannot be successfully carried out.

In most of the organizations, health care for employees is ignored. Sometimes employees work in a hazardous environment. The importance of safety and health care facilities in the context of quality cannot be over emphasized. Deficiency in the relevant measures and practice can significantly influence both health and psychology of the employees, which in turn affects their performance.

Application of statistical tools such DOE and SPC is very limited. In most of the cases where basic SPC tools are in use, the application procedure is not appropriate. That is why measurement of variability and process capability cannot be correctly ascertained and hence proper process control is not possible.

In Bangladesh, most of the organizations do not follow any standard—national or international. There are very few manufacturing organizations which implemented ISO standards.

1.5 OBJECTIVES OF THE STUDY/PROJECT WORK

The foregoing discussions amply demonstrate the gloomy picture of quality management system in industries of Bangladesh Unless the industries implement appropriate measures to improve their quality
management system as quickly as possible, it will be very difficult, if not impossible for them to stay in the business world, especially in the context of free market economy. They must produce quality products and maintain their competitive edge in the market. But this cannot be achieved in a day. A well-planned systematic study is to be conducted to critically examine the existing situation in the industrial sector, weakness and limitations are to be identified and accordingly strategies and measures should be recommended. The present research study is an attempt to this direction. A survey would be conducted among a set of industries of Bangladesh and on the basis of the findings, specific recommendations will be suggested for different categories of industries. With this end in view, the following objectives have been defined for the research work:

1) To study the quality management systems in the various manufacturing industries of Bangladesh.
2) To rank the industries with respect to standard quality determinants
3) To identify the major quality related causes affecting the competitive edge in the context of free market economy.
4) To recommend various strategies to enhance the overall quality levels.

1.6 Organization of the research paper

The second chapter presents a background study for the work. It includes the various existing philosophies, quality assessment models and concepts on quality. These will be the useful tools to select appropriate quality determinants and devise methodology for assessment of quality
management systems in large and medium scale industries. This is discussed in the third chapter. In chapter-4, by applying the methodology on the survey findings, the large and medium scale industries are categorized in different levels and the improvement strategies for each level have been presented in chapter-5. The following two chapters are devoted to quality management of small and cottage industries. In chapter-6, the current status has been presented and few important quality improvement strategies have been outlined in chapter-7. The chapter-8 discusses the overall conclusions and recommendations.
Chapter Two

BACKGROUND STUDY

2.1 INTRODUCTION

The shift from the old management style to the new one, as discussed in the previous chapter, is a marked change what has been called a paradigm shift, i.e. the adoption and commitment to a totally new model that shatters and discredits old theories and models. Nowadays, most of the developed and developing countries of the world are adapting new management style in place of old one and are finding remarkable change in quality development. This chapter addresses some of the modern philosophies, existing models and concepts related to quality management. These will be the basic tools to be used in this research study to identify the various quality determinants to assess the quality systems of the industries.

2.2 MANAGEMENT PHILOSOPHY

The work of many dedicated people has shaped contemporary quality thinking. Qualitative as well as quantitative contributions has been critical in the emergence and development of contemporary quality knowledge. Many philosophies show the path for successful implementation of quality
management. Major aspects of some of the renowned philosophies have been briefly discussed below.

2.2.1 Deming's Philosophy

Deming expresses that management is responsible for 94 percent of quality problems and charges them to help people work smarter, not harder[2]. Thus, productivity goals with no improvement of the process are counter-productive, leading to production of more defective output. A worker cannot produce a better product today if the real problem is the same defective material or faulty process he or she had to use yesterday.

Deming view: “Inspection does not improve quality, nor guarantee it”[3]. Inspection is too late, ineffective and costly. Faulty products should be prevented rather than rejected. SPC provides evidence of quality and should replace inspection.

He also realized that management needed full cooperation of people doing the work, as well as a communication medium common to both sides in order to understand fully what happens within the process. Being a statistician, he saw that statistics was the perfect medium for that transfer of information. He stresses process stability and system changes as keys to quality improvement.
Deming views an organization as a holistic entity. By following his management philosophy, an organization will gain quality processes, quality of products, and improved productivity.

Deming's 14 points for management are a radical departure for most managers and must be fully understood and implemented from the top down to be successful. The 14 points are:

1. Create constancy of purpose toward improvement of product and service.
2. Adopt the new philosophy.
3. Cease dependence on mass inspection. Require instead, statistical evidence that quality is built in.
4. End the practice of awarding business on the basis of price tag.
5. Find problems.
6. Institute modern methods of training on the job.
7. Institute modern methods of supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company.
10. Eliminate numerical goals, posters, and slogans for the work force, asking for new levels of productivity without providing methods.
11. Eliminate work standards that prescribe numerical quotas.
12. Remove barriers that stand between the hourly worker and his right to pride of workmanship.
13. Institute a vigorous program of education and retraining.
14. Create a structure in top management that will push every day in the above 13 points

2.2.2 Juran's Philosophy*

Juran was the first to focus on the issue of managing for quality as well as to point out that conformance to specifications does not necessarily mean fitness for use. He pointed to the issues of organization, coordination of functions, and communication, comprising the human element of quality management as a necessary consideration. He believes that management is responsible for 80% of quality problems and that all major quality problems are interdepartmental.[9]

Juran stresses the importance of communication between management and the rest of the employees and favours quality circles towards that purpose. He recognized the importance and complexity of purchasing and the supplier's contribution to the quality product. He stresses the necessity for international standards in today's multinational production environment. Juran does not favour single-sourcing. He explains that "for important purchases it is well to use multiple sources of supply". A single source can more easily neglect to sharpen its competitive edge in quality, cost and service. He admires the Japanese means of qualifying vendors that includes looking at process capabilities and controls, teamwork relationships, SPC training and the quality of the vendor's prior deliveries. He believes vendors should be part of the team.
2.2.3 Crosby's Philosophy

Crosby coined the term zero defects and advocates prevention as the means for quality improvement. He explains that zero defects are a management performance standards, not an employee motivation program. He defines quality as conformance and zero defects as standard. He maintains that no level of error, no matter how restrictive, is acceptable. He identifies the three elements of prevention: determination, education and implementation. He stresses the importance of clearly defined requirements, since defects are equated with not meeting the requirements.

2.2.4 Conway's Philosophy

Conway first became involved with the quality improvement process when he was Chief Executive Officer (CEO) of the Nashua Corporation and hired Deming as management consultant. He admired, absorbed and applied the Deming Philosophy and then expanded on it to develop his *Right Way to Manage*. Since he believes that management is not yet convinced of the fact that quality increases productivity and lowers costs, he sees the necessity for a new system of management with the recognized primary task of continuous improvement. He looks at the total picture of improvement to include the total "development, manufacture, administration and distribution of consistent low cost products and services that customers want and/or need". He identifies six "tools" of quality
improvement: human relations, surveys, simple statistics, SPC, imagineering and industrial engineering

Conway advocates elimination of waste and just-in-time inventory. He recognizes the importance of SPC. "The use of statistics is a common sense way of getting into specifics". But he adds, "statistics don't solve problems. They identify where the problems are and point managers and workers towards solutions". He believes in simple statistical tools for most of the company's diverse problems and the more complicated process control methods for the select few problems. Conway stresses the proper use of the tools. Beyond the gathering of data is the necessity of analyzing and evaluating that data, to determine possible solutions and select and implement the best ones.

2.2.5 Genichi Taguchi Philosophy

Taguchi emphasizes an engineering approach to quality. He stresses producing to target goals or requirements with minimal product performance variation in the customer's environment. Taguchi identifies three distinct types of variation:

1. External variation - variables in the environment or conditions that disturb product functions (e.g. temperature, humidity, & dust).
2. Deterioration variation or internal noise - changes that occur as a result of wear or storage.
3. Unit-to-unit variation – difference between individual products that are manufactured to the same specifications.

The objective is to minimize variation through on-line and off-line quality activities. The Taguchi concept proposes the use of optimization theory and techniques, along with experimental design, with the ultimate objective of minimizing the loss to society.

According to traditional view, the cost of non-conformance only emerges once the product is out of specification limits. But Taguchi suggests that the cost or loss commence as soon as the product deviates from target or nominal value.

This conception is known as the Taguchi loss function. This can be depicted by the Figure-2.¹

![Figure 2. The quality loss function](image)

¹ T – Target value
USL – Upper Specification Limit
LSL – Lower Specification Limit
According to Taguchi’s loss function, the product which deviates from
target value will incur a loss whether it is within specification limits or not.

From the analysis of the foregoing philosophies, it may be concluded that
for effective quality control and quality management the following activities
are essential:

1. Company-wide quality control with participation of all members.
2. Quality control education and training
3. Quality control circle activities aimed at self development
4. QC audits
5. Utilization of statistical methods and
6. System design and quality function deployment.

2.3 QUALITY ASSESSMENT MODELS

One of the main problems with quality development is that there is no
single, prescriptive approach. The tools, techniques, systems and methods
described throughout this thesis paper may be applied in an appropriate
way to suit the organizational challenge. The reason that there is no single
route to quality development is that there is no single starting point nor a
single destination. There is a need, however, to be able to validate an
organization’s claim to total quality and also a need for companies to
measure their own comparative level of quality development. In response
to these needs a number of international quality assessment mechanisms have been developed. The three most important of these are:

- the European Quality Award (primarily used in Europe);
- the Malcom Baldrige Award (primarily used in the United States);
- the Deming Award (primarily used in Japan).

The European Quality Award (EQA)

It is a quality assessment scheme developed and managed by the European Foundation for Quality Management (EFQM). The assessment criteria are divided into five basic areas as illustrated in Figure 3. The EQA classifies the areas of assessment into either enablers or results. The enablers are the business activities which are employed to produce the results.

![Figure 3: The European Quality Award assessment model.](image-url)
Each of the nine elements of the EQA model is assessed through a comprehensive self-appraisal questionnaire to measure an organization's quality development.

The Malcolm Baldrige Award

It was established in 1987 to promote quality improvement and recognized achievement amongst American companies in the way the Deming Award had in pan. The Baldrige Award assessment is based upon seven categories divided into leadership, system, measures and goals as shown in Figure 4.

![Figure 4 The Malcolm Baldrige Award assessment model](image)

The Deming Award

The Deming Award uses ten categories of quality activities as illustrated in Figure 5.
The foregoing quality assessment models show the ways to improve quality management system. These renowned models would keep an important role in this thesis work to select the quality determinants. The themes of these models would also be helpful during the establishment of improvement strategies for different industries.

2.4 QUALITY BENEFITS

Apparently, it seems that since improving quality involved cost, the result is lowered profits. For organizations looking for short-term profits, this myth
is true, but in today's competitive market, short-term profits are no longer the goal of an organization. Company's look for long-term profits and to establish a firm position in the market. Quality improvement helps to meet these ends. There are two types of quality costs: conformance costs and non-conformance costs. The former includes planning, training, auditing, process control, design and data analysis, inspection, maintenance costs etc. Whereas, the latter includes scrap, rework, retest, downtime, yield loss, disposition complaints, warranty, concession, liability costs etc. It is proved that through quality development, costs of non-conformance (problem solving) are decreased with the increase of conformance costs (system planning) such that the total quality cost is reduced. It is depicted in Figure 6 & 7.
Improve quality reduces the number of scraps, rework and complaints and thus improves the productivity. This, in turn, decreases the cost of production and the price can be lowered. Lower prices help increase the market and helps the organization to stay in business. The company can thus provide more jobs and benefits to the society. *The Deming Chain Reaction of Quality Benefits* outlines the process in short in Figure 8.
Figure 8 The Deming Chain Reaction of Quality Benefits
Chapter Three

METHODOLOGY FOR ASSESSMENT OF QUALITY MANAGEMENT SYSTEM IN LARGE & MEDIUM SCALE INDUSTRY

3.1 INTRODUCTION

Before ascertaining the current status of the industries to suggest various recommendations, it is very important to identify the different quality determinants. This chapter is devoted to selecting the important determinants, based on the philosophies and quality assessment models discussed in chapter-2, scoring them according to their importance. On the basis of these determinants a questionnaire will be produced for conducting a survey in various industries.

3.2 Selection & Importance of quality determinants:

A manufacturing system usually employs a series of value-adding manufacturing processes to convert the raw materials into more useful forms and eventually into finished products. Production management takes a number of steps to get final product. Production planning and control constitutes one of the main subject areas of the production management. Production management must ensure the quality of production process from designing to finished product[9]. Earlier the concept quality
management emerged in production management. Gradually it spreads over all the activities of an organization including purchasing and marketing.

Basically the quality management is an integrated task of various areas of an organization. The main areas are (a) Administration/Management, (b) Purchasing; (c) Production process, (d) Marketing. In this project work, various quality determinants have been selected from each area which are directly or indirectly responsible for quality management. These determinants are shown area wise as below

a. Administration/Management

1. Commitment of top management about quality control
2. Availability of quality policy, vision and mission
3. Conception and evaluation of costs of quality
4. Education and training for employees
5. QC circle activities
6. Involvement of consumer in design and development
7. Internal quality control audit
8. Quality control audit by the outsiders
9. Implementation of ISO & National Standards
10. Working environment, safety facilities and health care system for employees
11. Formation of quality improvement team
12. Implementation of quality award.
b. **Purchasing**

1. Quality control for suppliers and purchasers
2. Testing of incoming goods

c. **Production process**

1. Utilization of statistical methods for process control
2. Handling of non-conforming products
3. Inspection procedure during production
4. The system of production control
5. The status of production process
6. Calibration system of measuring instrument
7. Product support.

d. **Marketing**

1. Product support
2. Inventory control
3. Service facilities and warranty system
4. Data collection for customers' feedback.

From the above, some of the major determinants will now be discussed in brief to show their importance in quality management system.

1. **Commitment of Top Management**
Top management of an organization establishes goals and guidelines that deal with various major issues such as consumer groups, market share, quality standard, production costs etc. These are all related to quality
management system. Therefore, to ensure that a good quality program will be successfully run in an organization, the role of its top management - their vision, effort, sincerity is the most important determinant.

2. Education and training for employees

A prominent quality expert of Japan, Mr. Karou Ishikawa[2] says "Quality control begins with education and ends with education"[7]. To promote QC with participation by all, QC education must be given to all employees from the president to assembly line workers. QC is a 'thought revolution' in management; so the thought process of all employees must be changed. To accomplish this, education and training must be given to all according to their requirements.

3. Utilization of statistical methods

QC experts of the world are of the opinion that using appropriate statistical methods (SPC tools, D O.E), it is possible to eliminate about 92 percent of quality related problems during production* and keep the process in control within the tolerance limits. To identify the variables responsible for non-conformance, statistical methods play the vital role. So the factor is very important.
4. **QC circle activities**

Through QC circle activities, each member of a circle becomes an asset of an organisation. The loyalty of the employee towards the organisation increases through QC circle activities. Better communication is ensured among the members of the circle and in turn among the employees of all stages. So to implement total quality management (TQM) in an organization, QC circle activities are considered to be of paramount importance.

5. **Quality control for suppliers and purchasers**

High level of quality can be maintained if the suppliers and purchasers work together for quality control. Raw materials share more than 60% of the cost of a product. If raw materials are not of good quality, it is impossible to ensure product quality.

6. **Internal quality control audit**

The main responsibility of an internal quality control audit is to check the effectiveness of the policies and procedures adopted for quality improvement. It audits the process of quality control, makes appropriate diagnosis and recommends proper measures to correct the shortcomings. It is thus considered an important quality determinant.
7. QC audit by outsiders

If an organization is audited by outside consultants or quality experts, its position in business is examined against national and/or international standards. The organization can use the experts' report to devise improvement strategies and enhance its overall performance level.

8. Document control and quality record

The documents, an important part of the quality system (Procedures, specifications, detailed instructions etc.) should be issued in a controlled way which indicates the respective authorities and conditions of approval. For any change, they would be used effectively.

The records of the performance of the quality system such as contract reviews, sub-contractor assessments, test records, calibration data etc. are very important for smooth running of quality management system.


The ISO certified organizations have well defined methods and procedures, which help the employees work in proper ways. That is why, they ensure the quality management of international standard.

In present business arena, ISO certification plays a vital role for any organization. The easy access of products in the world market (especially
in developed countries) depends on ISO certification. The implementation of ISO standard is thus considered an important quality determinant.

10. Availability of quality policy vision & mission

The quality policy is a blanket statement usually widely publicized to customers (internal & external) about the product and service of an organization. A clear-cut vision and mission inspires and directs the employees to go in definite track to achieve the organization goal.

11. Data collection for customer feedback.

It is stated earlier that quality is the determination of the customers. Perhaps the most critical factor in providing the impetus to achieving the final stage of total quality development is customer orientation. Focusing upon the customer and customer service is a prerequisite to developing and sustaining a total quality culture. Moreover, the loyalty of customers is generated through orientating the whole organization towards serving the customer. The business importance of customer loyalty has been identified by considerable research which has shown in general:

- Over 60% of an organization's future revenues come from existing customers;
- a 2% increase in customer retention has an equivalent impact upon profitability as a 10% reduction in operating costs;
- Up to 96% of unhappy customers do not in fact complain, but they are three times more likely to communicate a bad experience to other customers than a good one;
- If a customer complains and the organization responds effectively to product or service failure then the loyalty of the customer can actually increase.

So 'customer feedback' is an important element in present business world.

12. Testing of incoming and finished products/goods

The incoming goods should be tested properly during purchasing to ensure the quality. The final release should be allowed only when the goods are examined by the specified testing methods. Similarly, the finished products must be tested before delivery according to specified methods. An organization which follows the national / international standard for testing, it could easily meet the required specifications as well as the customer satisfaction.

13. Way of production control

An organization must ensure that its production process is being run under proper control. This is achieved if the followings are present:

- Production method and sequence are properly defined and documented.
• Batches are clearly identified and recorded
• Inspection control is properly executed and documented

If proper control is experienced on the production process, any fault can be easily detected and corrected immediately.

14. Status of production process:

Quality paradigms in the ways of thinking about quality and doing quality activities are changing day by day. Presently in the developed countries, custom craft paradigm is shifted to techno-craft paradigm due to continuous improvement of technology. A high level of flexibility in product design and process design is possible using CAD, CAM, CIM technology along with NC, CNC machinery. It is also possible to reduce wastage, increase production volume, reduce delivery time, find the causes of variation, reduce cost using modern production processes.

15. Product support (Handling, storage, packaging & delivery of product)

To retain product quality, handling, storage, packaging and delivery of product are very important. To protect/prevent the product from damage or deterioration, products would be handled and stored in a controlled way. For the conformance of requirements and damage free and timely delivery of the products to the customers, attractive and protective packaging and safe delivery should be ensured.
16. Inventory control

Inventories deal with maintaining sufficient stocks of goods that will ensure a smooth operation of a production system or a business activity. Traditionally, inventory has been viewed by business and industry as a necessary evil: too little of it may cause costly interruptions in the operation of the system, and too much of it can ruin the competitive edge and profitability of the business. From that standpoint the only effective way of coping with inventory is to minimise its adverse impact by striking a "happy medium" between the two extreme cases.

Various inventory techniques are available as management tools like, the ABC inventory system, EOQ model, JIT etc. The success of inventory control depends on the proper application of different techniques.

17. Service facilities & warranty system

This factor is related to customers' satisfaction. If customers get congruent service facilities after buying the product from an organisation, during the warranty period, they might be loyal to the organisation. In today's business an organisation should provide adequate service facilities including skilled and modest manpower to serve the customers after sale. It should also provide a definite warranty period and maintain commitment to increase customers' satisfaction and loyalty.
18. Working environment & health care for employee

It is proved that to satisfy external customers (consumer), an organization must satisfy its internal customers (employee). Working environment is an important factor in this regard. If the overall working environment is good, the employees try to give their maximum effort towards the organization. The adequate health care facilities for the employees create a close bond between the organization & employees. Accordingly, employees feel themselves as a part of the organization and try to provide it maximum service.

3.3 Scoring of the determinants:

The quality determinants should be scored differently according to their importance. To facilitate proper scoring, some qualifying factors are considered for each quality determinant. This section assigns scores to the determinants and their respective qualifying factors. The scoring (weightage) has been done by subjective judgement.
<table>
<thead>
<tr>
<th>Determinants</th>
<th>Weightage</th>
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</thead>
<tbody>
<tr>
<td>1. Commitment of top management about QC</td>
<td></td>
</tr>
<tr>
<td>a. Strong commitment</td>
<td>5</td>
</tr>
<tr>
<td>b. Moderate commitment</td>
<td>3</td>
</tr>
<tr>
<td>c. Weak commitment</td>
<td>2</td>
</tr>
<tr>
<td>d. No commitment</td>
<td>0</td>
</tr>
<tr>
<td>2. Education &amp; Training for employee</td>
<td>5</td>
</tr>
<tr>
<td>a. Training &amp; education for each level</td>
<td>5</td>
</tr>
<tr>
<td>b. Training &amp; education for management &amp; foreman level</td>
<td>4</td>
</tr>
<tr>
<td>c. Training &amp; education only for management</td>
<td>3</td>
</tr>
<tr>
<td>d. Training &amp; education only for workers</td>
<td>2</td>
</tr>
<tr>
<td>e. No formal training system</td>
<td>0</td>
</tr>
<tr>
<td>3. Utilization of statistical methods</td>
<td>5</td>
</tr>
<tr>
<td>a. Use of advanced statistical methods (D O.E )</td>
<td>5</td>
</tr>
<tr>
<td>along with elementary SPC tools</td>
<td></td>
</tr>
<tr>
<td>b. Use of basic SPC tools along with sampling method</td>
<td>4</td>
</tr>
<tr>
<td>c. Use of basic seven SPC tools only</td>
<td>3</td>
</tr>
<tr>
<td>d. None of the above</td>
<td>0</td>
</tr>
<tr>
<td>4. QC circle activities</td>
<td>5</td>
</tr>
<tr>
<td>a. Involvement of every worker including foreman in QC circle</td>
<td>5</td>
</tr>
<tr>
<td>b. Presence of some QC circles as sample</td>
<td>3</td>
</tr>
<tr>
<td>c. No QC circle</td>
<td>0</td>
</tr>
</tbody>
</table>
5. Quality control for suppliers & purchasers
   a. Use of QC techniques by both vendee and vendor with mutual understanding & co-operation
   b. Vendor is responsible for the quality assurance
   c. Vendee's careless attitude towards the QC activities of vendor

6. Internal quality control audit
   a. Audit is performed by company president
   b. Audit is performed by QC staff
   c. Audit is performed by the head of each unit
   d. No audit is performed

7. QC audit by the outsiders
   a. QC audit is performed by the consultant(s)
   b. QC audit of the supplier is performed by purchaser
   c. QC audit by is perform by an organization for the certification
   d. No system for QC by outsider

8. Document control and quality record
   a. Documentation is in controlled way and records are easily retrievable in each section
   b. Documentation is performed in selected sections and records are preserved haphazardly
   c. There is no document control system
9. Implementation of ISO standard & national standard

a. Already got the ISO certification

b. Implementation of standards and are in the final stage of getting ISO certification

c. Maintain national standard only

d. Does not care about any standard

10. Working environment, safety facilities and health care

a. Clinical treatment facilities are equipped within the organization according to industrial law with good working environment and safety facilities

b. There is no clinic in factory premises but periodic treatment facilities and financial aid are imposed to everyone for health care and working environment is average

c. The organization does not concern over health care & working environment

11. Formation of quality improvement team

a. There is a quality improvement team including selected personnel from each level

b. There is an improvement team formed with management personnel only

c. There is no improvement team
12. Availability of quality policy vision & mission – 4

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Quality policy vision &amp; mission of the organization is well known to all.</td>
</tr>
<tr>
<td>b.</td>
<td>Policy, vision &amp; mission is preserved and followed by management only.</td>
</tr>
<tr>
<td>c.</td>
<td>There is no written documentation for quality policy, vision &amp; mission.</td>
</tr>
</tbody>
</table>

4
2
0

13. Data collection for customer feedback – 4

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>There is a definite system for data collection.</td>
</tr>
<tr>
<td>b.</td>
<td>There is no definite system but data are collected haphazardly.</td>
</tr>
<tr>
<td>c.</td>
<td>The data collection system is absent.</td>
</tr>
</tbody>
</table>

4
2
0

14. Involvement of consumer in design & development – 4

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Consumer group is taken during design &amp; development.</td>
</tr>
<tr>
<td>b.</td>
<td>Consumer’s suggestion is taken only for product development.</td>
</tr>
<tr>
<td>c.</td>
<td>There is no consumer involvement in design &amp; development.</td>
</tr>
</tbody>
</table>

4
2
0

15. Handling of non conforming product – 4

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Prevention method along with rework system is performed.</td>
</tr>
<tr>
<td>b.</td>
<td>Only prevention method is applied.</td>
</tr>
<tr>
<td>c.</td>
<td>Only rework system is available.</td>
</tr>
<tr>
<td>d.</td>
<td>There is no system for control.</td>
</tr>
</tbody>
</table>

4
3
2
0
16. Testing of incoming and finished products
a. Testing is performed according to international standard 4
b. Testing is performed according national standard 3
c. Testing is performed according to the standard set by the engineers & scientists 2
d. There is no specific standard for testing 0

17. Conception & evaluation of cost of quality
a. The organization holds clear conception about quality costs and has methodology for their evaluation 3
b. It holds positive attitude about quality but has no clear conception & methodology for the evaluation of quality costs 2
c. There is a myth & misconception that quality improvement increases the cost 0

18. Inspection procedure during production
a. Inspection is performed on the basis of periodic & random sampling 3
b. Inspection is performed on the basis of periodic sampling only 2
c. Inspection is performed at random 1
d. There is no definite inspection procedure 0

19. Calibration system of measuring instrument
a. Calibration is performed periodically (two times/year) 3
b. Calibration has not been performed for two year 2
c. Calibration has not been performed more than two years 0
20. The way of production control

a. Production method and sequence are properly defined and documented and the batches are clearly identified & recorded.

b. Production methods are defined but there is no system to identify the batches

c. There is no proper method

21. The status of production process

a. The production process holds CIM or fully automated process with modern machinery

b. Semiautomatic process with modern machinery

c. Semiautomatic process with obsolete or outdated machinery is present

22. Product support (Handling, storage, packaging & delivery)

a. International standard is followed for product support

b. Company standard imposed by Engineers or scientists of the organization is followed

c. There is no specific standard for product support

23. Inventory control

a. JIT technique is used for inventory control

b. Inventory control is performed applying traditional methods

c. There are no specific methods for inventory control
24 Service facilities & warranty system

a. Service facilities after sell are available on the basis of contact 3
b. Service facilities are given on the basis of additional payment & there is no warranty system 2
c. There is no warranty or service facilities after sell 0

25. Implementation of quality award

a. There is a quality award system for the best working group (QC circle) 2
b. 'Quality award' is given periodically for the employees on the basis of performance 1
c. There is no system for quality award 0

3.4 Formation of the questionnaire

On the basis of the selected determinants as outlined above, a questionnaire is constructed to conduct a survey among different industries. From the survey findings, with respect to each organization, the total score of all the determinants will be calculated. The score will reflect the level of quality management system of that organization. This section presents below the structure of the questionnaire.

Q.1. How many seminars on QC/QM were arranged in the last two years?

One □ Two □ Three □ None □
Q.2. How many personnel are sent abroad for training on quality management?

Q.3. How many personnel are trained from renowned service organization of the country? Please explain ____________________

Q.4. Is there any quality improvement team?
   Yes ☐  No ☐

Q.5. Who are the members of quality improvement team?

Q.6. Have you any quality manual?

Q.7. Is there any permanent consultant to monitor the QC activities? Who?

Q.8. Does the organization have any QC department?

Q.9. Is there any system to educate and train the employees on QC? Please explain ____________________

Q.10. Is there any in-house training program?

Q.11. Who is/are the trainer(s)? and Who is/are the trainees(s)?

Q.12. Does the organization use statistical methods?

Q.13. What type of SPC tools is used?

Q.14. How many QC circles are present in the organization?

Q.15. Is there any contract with supplier of raw materials on QC?

Q.16. Is there any internal quality control audit system?

Q.17. Who is the internal QC auditor?
   Company President ☐     QC staff ☐
   Head of the each unit ☐  None ☐

Q.18. Is there any external QC audit system?
Q.19 Who is the external auditor?

☐ Consultant  ☐ Certification body  ☐ Customer

Q.20 How are the documents preserved? Please state ________________

Q.21 Has the organization got ISO certification? ________________

Q.22 Do you have any plan to implement ISO standard? Explain _____

Q.23 What is the progress of the activities for ISO certification?

Q.24 What is the quality policy of the organization?

Q.25 What is the vision of the organization?

Q.26 What is the mission of the organization?

Q.27 Is there any system to take customer feedback? What is the method?

Q.28 What is the comment on quality improvement?

☐ Cost is increased for quality improvement

☐ Cost is decreased for quality improvement

☐ No effect on cost for quality improvement

Q.29 What percent is lost due to scrape & waste?

Q.30 Is there any involvement of consumer in design and development? Explain

Q.31 What method is used for handling non-conforming products?

☐ Preventive method along with rework system

☐ Only rework system

☐ Only preventive method

Q.32 What methods are used for testing the raw materials? What standard is followed?
Q.33 What methods are applied for testing finished products?

- Periodic sampling
- 100% Inspection
- Random sampling
- None

Q.34 What inspection method is used during production?

- Periodic sampling
- Random sampling
- Both
- None

Q.35 When does the inspector inspect the product?

- After production
- During production
- In both time
- Not any time

Q.36 What is the calibration system of measuring instrument?

Q.37 What is the way of production control? Explain

Q.38 What type of production process is present?

- Fully automatic
- Semiautomatic with modern machinery
- Semiautomatic with obsolete machinery

Q.39 What is the standard of product support (Handling, storage, packaging, & delivery)?

- International standard
- Standard established by management executives
- No specific standard

Q.40 What is the method of inventory control?

- JIT technique
- ABC model / other model
- No particular method
Q.41 How do you store the finished products?

Q.42 How do you deliver the products to the market?

Q.43 Is there any warranty system for products? Explain

Q.44 What is the service strategy after sale?

Q.45 Is there any system to exchange the defective products by good ones?

Q.46 Is there any system for the payment of Indemnity?

Q.47 How many service stations are present?

Q.48 Is there any quality award system? Explain

Q.49 What is the health care system for employees?

Q.50 What is the working environment? Explain with temp, pressure and, crowd.

Q.52 What is frequency of meeting on QC in management level?

Q.53 Is there any system to take decision form workers level for quality planning?

Q.54 What are the impediments of the organization to implement TQM?
Chapter Four

CURRENT STATUS OF LARGE AND MEDIUM SCALE
INDUSTRIES OF BANGLADESH ABOUT
QUALITY MANAGEMENT

4.1 Introduction

A survey has been conducted in various large and medium scale manufacturing industries of Bangladesh using the questionnaire mentioned in the earlier chapter. The findings of the survey have been accumulated in appendix of this paper. From the appendix, the statements which are directly related to the quality determinants have been segregated and used in this chapter. Each of the organizations has been scored aggregating the points against every quality determinant, then each of the organizations has been ranked on the basis of total points scored. The procedures of scoring and ranking have been prescribed and depicted in the following section.

4.2 Status of the Organizations

This section will show the findings of the survey corresponding to every quality determinant for each organization and also show the total point scored by the organization. It is to be noted that in scoring a quality
determinant for a specific organization only the relevant qualifying factor (not the determinant) is mentioned.

**Organization – 1**

<table>
<thead>
<tr>
<th>Findings against quality determinants</th>
<th>Acquired Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment of top management about QC is strong</td>
<td>5</td>
</tr>
<tr>
<td>2. There is a training system only for management level</td>
<td>3</td>
</tr>
<tr>
<td>3. Sampling method is used along with basic SPC tools</td>
<td>4</td>
</tr>
<tr>
<td>4. There is no QC circle</td>
<td>0</td>
</tr>
<tr>
<td>5. Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>6. Internal QC audit is performed by QC staff</td>
<td>4</td>
</tr>
<tr>
<td>7. QC audit by outsider is performed by a consultant</td>
<td>5</td>
</tr>
<tr>
<td>8. Documentation is in controlled way and is easily retrievable in each section</td>
<td>5</td>
</tr>
<tr>
<td>9. The organization has got ISO-9002 certification</td>
<td>5</td>
</tr>
<tr>
<td>10. Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employees</td>
<td>3</td>
</tr>
<tr>
<td>11. There is a quality improvement team holding management executives only</td>
<td>3</td>
</tr>
<tr>
<td>12. There is a quality manual including vision and mission</td>
<td>4</td>
</tr>
<tr>
<td>13. There is no definite system for data collection for customers' feedback but collect randomly</td>
<td>2</td>
</tr>
<tr>
<td>14. There is no consumer involvement in design and development</td>
<td>0</td>
</tr>
</tbody>
</table>
15. Prevention method along with rework system is applied to control non-conformity

16. Testing of incoming and finished goods is performed according to ISO-9002 standards

17. There is a positive attitude towards quality costs but methodology is not established for the evaluation

18. Inspection is performed on the basis of periodic and random sampling during production

19. Calibration is not performed periodically

20. Production method and sequence are properly defined and the batches are clearly identified and recorded

21. Semiautomatic process with modern machinery is used

22. International standard is applied for product support

23. Inventory control is performed but standard methodology is Not applied

24. There is a definite warranty system for products

25. Quality award is not performed

| Total | 74 |

**Organization 2**

**Findings against quality determinants**

<table>
<thead>
<tr>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>0</td>
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<td>4</td>
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<tr>
<th></th>
<th>Commitment of top management about QC is strong</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is a particular training system for management level</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Sampling method is applied with basic SPC tools</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>There is no QC circle</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
</tbody>
</table>
6. Internal QC audit is performed by QC staff

7. QC audit by outsider is performed by a consultant

8. Documentation is in controlled way and is easily retrievable in each section

9. The organization has got ISO-9001 certification

10. Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employee

11. There is a quality improvement team with management executives only

12. There is a quality manual including vision and mission

13. There is a definite system for data collection for customers' feedback

14. There is no consumer involvement in design and development

15. Prevention method is applied only to control the non-conformity

16. Testing of incoming and finished goods is performed according to ISO-9001 standards

17. There is a positive attitude towards quality costs but no methodology for evaluation

18. Inspection is performed on the basis of periodic and random sampling during production

19. Calibration has not been performed for two years

20. Production method and sequence are properly defined and the batches are clearly identified and recorded

21. Semi-automatic process with modern machinery is used

22. International standard is applied for product support

23. Inventory control is performed but no standard methodology is applied

24. There is no warranty system for products
25. There is no quality award system

<table>
<thead>
<tr>
<th>Findings against quality determinants</th>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment of top management about QC is strong</td>
<td>5</td>
</tr>
<tr>
<td>2. There is a little training system only for worker</td>
<td>2</td>
</tr>
<tr>
<td>3. Some basic SPC tools are used</td>
<td>3</td>
</tr>
<tr>
<td>4. Every worker is involved in QC circles activities</td>
<td>5</td>
</tr>
<tr>
<td>5. Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>6. There is no internal QC audit</td>
<td>0</td>
</tr>
<tr>
<td>7. There is no QC audit system by outsider</td>
<td>0</td>
</tr>
<tr>
<td>8. Documentation is in controlled way and is easily retrievable in each section</td>
<td>5</td>
</tr>
<tr>
<td>9. The organization maintains the national standard</td>
<td>3</td>
</tr>
<tr>
<td>10. Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employees</td>
<td>3</td>
</tr>
<tr>
<td>11. There is no quality improvement team</td>
<td>0</td>
</tr>
<tr>
<td>12. There is no documented quality policy, vision and mission</td>
<td>0</td>
</tr>
<tr>
<td>13. There is no definite system for data collection for customers' feedback but collect randomly</td>
<td>2</td>
</tr>
<tr>
<td>14. There is no consumer involvement in design and development</td>
<td>0</td>
</tr>
</tbody>
</table>

Total = 73
15. Prevention method along with rework system is applied to control non-conformity 3

16. Testing of incoming and finished goods is performed according to national standard 3

17. There is a positive attitude towards quality costs but there is no methodology for evaluation 2

18. Inspection is performed on the basis of periodic and random sampling during production 2

19. Calibration has not been performed for a long time 0

20. Production method is defined but there is no system to identify the batches 2

21. Semiautomatic process with modern machinery is used 2

22. Company's own standard is applied for product support 2

23. There is no specific method for Inventory control 0

24. There is a definite warranty system for products 3

25. Quality award is given occasionally to good performer 2

Total = 53

Organization 4

Findings against quality determinants

<table>
<thead>
<tr>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment of top management about QC is weak</td>
</tr>
<tr>
<td>There is no formal training and education system</td>
</tr>
<tr>
<td>The organization uses some basic SPC tools</td>
</tr>
<tr>
<td>There is no QC circle</td>
</tr>
<tr>
<td>Only vendor is responsible for the assurance of quality of raw materials</td>
</tr>
</tbody>
</table>
6. There is no Internal QC audit system

7. There is no QC audit system by outsider

8. Documentation is performed in selected units but records are preserved haphazardly

9. The organization maintains national standard and it does not work for ISO certification

10. Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employee

11. There is no quality improvement team

12. There is no clear cut quality policy, vision and mission

13. There is no definite system for data collection for customers' feedback, but relative action is performed on the basis of complaints if any

14. There is no consumer involvement in design and development

15. Prevention method along with rework system is applied to control the non-conformity

16. Testing of incoming and finished goods is performed according to national standards

17. There is a misconception about quality costs

18. Inspection is performed on the basis of periodic sampling only during production

19. Calibration has not been performed for a long time

20. Production method and sequence are properly defined and the batches are clearly identified and recorded

21. Semiautomatic process with modern machinery is used

22. Company's own standard is applied for product support

23. There is a careless attitude about Inventory control
24. There is a warranty system but no service facilities 2
25. There is no quality award system 0

Total = 36

Organization 5

Findings against quality determinants

<table>
<thead>
<tr>
<th></th>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Commitment of top management about QC is moderate</td>
</tr>
<tr>
<td>2.</td>
<td>There is no formal training and education system only for management level</td>
</tr>
<tr>
<td>3.</td>
<td>The organization uses some basic SPC tools</td>
</tr>
<tr>
<td>4.</td>
<td>There is no QC circle</td>
</tr>
<tr>
<td>5.</td>
<td>Only vendor is responsible for the assurance of quality of raw materials</td>
</tr>
<tr>
<td>6.</td>
<td>There is no Internal QC audit system</td>
</tr>
<tr>
<td>7.</td>
<td>There is no QC audit system by outsider</td>
</tr>
<tr>
<td>8.</td>
<td>Documentation is performed in selected units but records are preserved haphazardly</td>
</tr>
<tr>
<td>9.</td>
<td>The organization maintains national standard and it does not work for ISO certification</td>
</tr>
<tr>
<td>10.</td>
<td>Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employee</td>
</tr>
<tr>
<td>11.</td>
<td>There is no quality improvement team</td>
</tr>
<tr>
<td>12.</td>
<td>Quality policy, vision and mission are preserved and followed and they are not exposed to everyone</td>
</tr>
<tr>
<td>13.</td>
<td>There is no definite system for data collection for customers' feedback</td>
</tr>
<tr>
<td>14.</td>
<td>There is no consumer involvement in design and development</td>
</tr>
</tbody>
</table>
15. Prevention method is applied to control the non-conformity 3
16. Testing of incoming and finished goods is performed to according national standards 3
17. There is a positive attitude towards quality costs but methodology is not established for the evaluation 2
17. Inspection is performed on the basis of periodic sampling Only during production 2
18. Calibration has not been performed for a long time 0
20. Production method and sequence are properly defined and the batches are not clearly identified and recorded 2
21. Semiautomatic process with modern machinery is used 2
22. Company's own standard is applied for product support 2
23. There is a careless attitude about Inventory control 0
25. There is a warranty system, products are exchange According to warranty 3
25. There is no quality award system 0

Total = 43

Organization 6

Findings against quality determinants

<table>
<thead>
<tr>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment of top management about QC is weak 0</td>
</tr>
<tr>
<td>2. There is no formal training and education system 0</td>
</tr>
<tr>
<td>3. The organization uses some basic SPC tools 3</td>
</tr>
<tr>
<td>4. There is no QC circle 0</td>
</tr>
<tr>
<td>5. Only vendor is responsible for the assurance of quality of raw materials 4</td>
</tr>
<tr>
<td>6. There is no Internal QC audit system 0</td>
</tr>
</tbody>
</table>
7. There is no QC audit system by outsider 0
8. Documentation is performed in selected units and records are preserved haphazardly 3
9. The organization maintains national standard and it does not work for ISO certification 3
10. Working environment is average and there is no adequate clinical facility for employees within the organization 2
11. There is no quality improvement team 0
11. Quality policy, vision and mission are preserved and followed by management only and they are not available for everyone 2
13. There is no definite system for data collection for customers' feedback 0
14. There is no consumer involvement in design and development 0
15. Prevention method is applied to control the non-conformity 3
16. Testing of incoming and finished goods is performed according to company's own standards 2
17. There is a misconception about quality costs 0
18. Inspection is performed on the basis of periodic sampling only during production 2
19. Calibration has not been performed for a long time 0
20. Production method and sequence are defined but the batches are not clearly identified and recorded 2
21. Semiautomatic process with modern machinery is used 2
22. Company's own standard is applied for product support 2
23. There is a careless attitude about inventory control 0
24. There is no warranty system and service facility 0
25. There is no quality award system 0

Total = 30
### Organization 7

**Findings against quality determinants**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Commitment of top management about QC is strong</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>There is a training system only for management level</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Some basic SPC tools are used</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>There is a few QC. Every worker is not involved in this activities</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>There is no internal QC audit system</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>External QC audit is performed by a consultant</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Documentation is performed in selected units but the records are preserved haphazardly</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>The implementation of ISO standard is in the final stage</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employees</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>There is a quality improvement team included selected personnel from each unit</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>There is no documented quality policy, vision and mission</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>There is no definite system for data collection for customer feedback</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>There is no consumer involvement in design and development</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Prevention method along with rework system is applied to control non-conformity</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Testing of incoming and finished goods is performed according to company's own standard</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>There is a positive attitude towards quality costs but methodology is not established for the evaluation</td>
<td>2</td>
</tr>
</tbody>
</table>
20. Inspection is performed on the basis of periodic and random sampling during production

19. Calibration has not been performed for two years

20. Production methods are defined but there is no system to identify the batches

21. Semiautomatic process with modern machinery is used

22. Company's own standard is applied for product support

23. There is no specific method for inventory control

24. There is no definite warranty system for products

25. There is no quality award system

Total = 54

**Organization 8**
**Findings against quality determinants**

1. Commitment of top management about QC is weak
2. There is no formal training and education system
3. The organization uses some basic SPC tools
4. There is no QC circle
5. Only vendor is responsible for the assurance of quality of raw materials
6. There is no internal QC audit system
7. There is no QC audit system by outsider
8. Documentation is performed in selected units and records are preserved haphazardly
9. The organization maintains national standard and it does not work for ISO certification
10. Working condition is average and there is no clinical facility for employees
11. There is no quality improvement team 0
12. There is no clear cut quality policy, vision and mission 0
13. There is no definite system for data collection for customer feedback 0
14. There is no consumer involvement in design and development 0
15. Rework system is applied only to control the non-conformity 2
16. Testing of incoming and finished goods is performed according to national standards 3
17. There is a misconception about quality costs 0
18. Inspection is performed on the basis of periodic sampling only during production 2
19. Calibration has not been performed for a long time 0
20. Production method and sequence are defined but there is no system to identify the batches 2
21. Semiautomatic process with obsolete machinery is used 1
22. No specific standard is followed for product support 0
23. There is a careless attitude about Inventory control 0
24. There is no warranty system and service facility 0
25. There is no quality award system 0

Total = 25

Organization 9

Findings against quality determinants

1. Commitment of top management about QC is strong 5
2. There is a training and education system only for management executives 3
3. The organization uses some basic SPC tools 3
4. There are a few QC circles
5. Only vendor is responsible for the assurance of quality of raw materials
6. There is no Internal QC audit system
7. There is no QC audit system by outsider
8. There is no proper documentation system
9. The organization maintains national standard and it does not work for ISO certification
10. Working condition is average and there is no clinical facility for employees
11. There is no quality improvement team
12. Quality policy, vision and mission are preserved and followed only by management
13. There is no system for data collection for customers' feedback
14. There is no consumer involvement in design and development
15. Prevention method is applied only to control the non-conformity
16. Testing of incoming and finished goods is performed according to standards company's own standard
17. There is a misconception about quality costs
18. Inspection is performed on the basis of periodic sampling only during production
19. Calibration has not been performed for a long time
20. Production method and sequence are properly defined and the batches are not clearly identified
21. Semiautomatic process with modern machinery is used
22. Company's own standard is applied for product support
23. There is a careless attitude about inventory control
24. There is no warranty system and service facility 0
25. There is no quality award system 0

Total = 38

Organization 10

Findings against quality determinants

<table>
<thead>
<tr>
<th>Findings</th>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment of top management about QC is weak</td>
<td>0</td>
</tr>
<tr>
<td>2. There is no formal training and education system</td>
<td>0</td>
</tr>
<tr>
<td>3. The organization uses some basic SPC tools</td>
<td>3</td>
</tr>
<tr>
<td>4. There is no QC circle</td>
<td>0</td>
</tr>
<tr>
<td>5. Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>6. There is no Internal QC audit system</td>
<td>0</td>
</tr>
<tr>
<td>7. There is no QC audit system by outsider</td>
<td>0</td>
</tr>
<tr>
<td>8. There is no proper documentation system</td>
<td>0</td>
</tr>
<tr>
<td>9. The organization maintains national standard and It does not work for ISO certification</td>
<td>3</td>
</tr>
<tr>
<td>10. Working condition is average and there is no clinical facility for employee</td>
<td>2</td>
</tr>
<tr>
<td>11. There is no quality improvement team</td>
<td>0</td>
</tr>
<tr>
<td>12. There is no clear cut quality policy, vision and mission</td>
<td>0</td>
</tr>
<tr>
<td>13. There is no system for data collection for customers’ feedback.</td>
<td>0</td>
</tr>
<tr>
<td>14. There is no system for data collection for customers’ feedback.</td>
<td>0</td>
</tr>
<tr>
<td>15. There is no consumer involvement in design and development</td>
<td>0</td>
</tr>
<tr>
<td>16. Rework system is applied only to control the non-conformity</td>
<td>2</td>
</tr>
</tbody>
</table>
16. Testing of incoming and finished goods is performed according to national standards 3
17. There is a misconception about quality costs. 0
18. Inspection is performed at random during production 1
19. Calibration has not been performed for a long time 0
20. There is no proper method for production control 0
21. Semiautomatic process with obsolete/obtained machinery is used 1
22. No specific standard is applied for product support 0
23. There is a careless attitude about inventory control 0
24. There is no warranty system and service facility 2
25. There is no quality award system 0

Total = 19

Organization 11

Findings against quality determinants

<table>
<thead>
<tr>
<th>Acquired</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment of top management about QC is moderated</td>
<td>3</td>
</tr>
<tr>
<td>There is a training and education system only for management level</td>
<td>3</td>
</tr>
<tr>
<td>The organization uses some basic SPC tools</td>
<td>3</td>
</tr>
<tr>
<td>There is no QC circle</td>
<td>0</td>
</tr>
<tr>
<td>Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>There is no internal QC audit system</td>
<td>0</td>
</tr>
<tr>
<td>There is no QC audit system by outsider</td>
<td>0</td>
</tr>
<tr>
<td>There is no proper documentation system</td>
<td>0</td>
</tr>
</tbody>
</table>
9. The organization maintains national standard and it does not work for ISO certification

10. Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employees

11. There is no quality improvement team

12. Quality policy, vision and mission are preserved and followed only by management

13. There is no definite system for data collection for customers’ feedback but relative action is performed on the basis of complaints if any

14. There is no consumer involvement in design and development

15. Prevention method is applied only to control the non-conformity

16. Testing of incoming and finished goods is performed according to international standards

17. There is a positive attitude towards quality costs but methodology is not established for the evaluation

18. Inspection is performed at random during production

19. Calibration has not been performed for two years

20. Production method and sequence are properly defined and the batches are clearly identified and recorded

21. Semiautomatic process with modern machinery is used

22. International standard is followed for product support

23. Inventory control is performed using ABC model

24. There is no warranty system and service facility

25. There is no quality award system

Total = 45
<table>
<thead>
<tr>
<th>Findings against quality determinants</th>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment of top management about QC is moderated</td>
<td>3</td>
</tr>
<tr>
<td>2. There is a training and education system only for management executives</td>
<td>3</td>
</tr>
<tr>
<td>3. The organization uses some basic SPC tools</td>
<td>3</td>
</tr>
<tr>
<td>4. There is no QC circle</td>
<td>0</td>
</tr>
<tr>
<td>5. Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>6. Internal QC audit system is performed by QC staff</td>
<td>4</td>
</tr>
<tr>
<td>7. There is no QC audit system by outsider</td>
<td>0</td>
</tr>
<tr>
<td>8. There is no documentation system</td>
<td>0</td>
</tr>
<tr>
<td>9. The organization follows national standard</td>
<td>3</td>
</tr>
<tr>
<td>10. Working condition is good, but safety facilities are not sufficient and there is no adequate clinical facility for employees</td>
<td>3</td>
</tr>
<tr>
<td>11. There is a quality improvement team formed with management personnel only</td>
<td>3</td>
</tr>
<tr>
<td>12. There is a clear cut quality policy including vision and mission</td>
<td>4</td>
</tr>
<tr>
<td>13. There is no system for data collection for customers' feedback</td>
<td>0</td>
</tr>
<tr>
<td>14. There is no consumer involvement in design and development</td>
<td>0</td>
</tr>
<tr>
<td>15. Prevention method is applied only to control the non-conformity</td>
<td>3</td>
</tr>
<tr>
<td>16. Testing of incoming and finished goods is performed according to national standards</td>
<td>3</td>
</tr>
<tr>
<td>17. There is a positive attitude towards quality costs but methodology is not established for the evaluation</td>
<td>2</td>
</tr>
</tbody>
</table>
18. Inspection is performed on the basis of periodic as well as sampling during production

19. Calibration has not been performed for two years

20. Production method and sequence are properly defined but there is no procedure to identify the batches

21. Semiautomatic process with modern machinery is used

22. Company's own standard is applied for product support

23. There is a careless attitude about inventory control

24. There is no warranty system and service facility

25. There is no quality award system

Total = 49

Organization 13

Findings against quality determinants

<table>
<thead>
<tr>
<th>Finding</th>
<th>Acquired points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment of top management about QC is weak</td>
<td>0</td>
</tr>
<tr>
<td>There is no formal training and education system</td>
<td>0</td>
</tr>
<tr>
<td>The organization uses some basic SPC tools</td>
<td>3</td>
</tr>
<tr>
<td>There are some QC circle</td>
<td>3</td>
</tr>
<tr>
<td>Only vendor is responsible for the assurance of quality of raw materials</td>
<td>4</td>
</tr>
<tr>
<td>There is no Internal QC audit system</td>
<td>0</td>
</tr>
<tr>
<td>There is no QC audit system by outsider</td>
<td>0</td>
</tr>
<tr>
<td>There is no proper documentation system</td>
<td>0</td>
</tr>
<tr>
<td>The organization maintains national standard and it does not work for ISO certification</td>
<td>3</td>
</tr>
<tr>
<td>Working condition is average and there is no clinical facility for employees</td>
<td>2</td>
</tr>
<tr>
<td>There is no quality improvement team</td>
<td>0</td>
</tr>
</tbody>
</table>
12. There is no clear cut quality policy, vision and mission  0
13. There is no system for data collection for customers'  feedback.  2
14. There is no consumer involvement in design and  development  0
15. Prevention method is applied only to control the  non-conformity  3
16. Testing of incoming and finished goods is performed  according to national standards  3
17. There is a misconception about quality costs.  0
18. Inspection is performed on the basis of periodic & random  sampling during production  3
19. Calibration has not been performed for a long time  0
20. Production method and sequence are defined but there  is no system to identify the batches  2
21. Semiautomatic process with modern machinery is used  2
22. Company's own standard is applied for product support  2
23. There is a careless attitude about Inventory control  0
24. There is no warranty system and service facility  0
25. There is no quality award system  0

Summary of the findings

The above findings regarding the quality systems of different organizations have been presented in Table-1.
<table>
<thead>
<tr>
<th>Determinants</th>
<th>Maximum Weighage (score)</th>
<th>Acquired weightage (score) by the organizations</th>
<th>Av. Condition of the Organization %</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Availability of quality policy, mission and vision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Data collection for customer feedback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Involvement of customer in design and development</td>
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<tr>
<td>15. Handling of non-conforming product</td>
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<tr>
<td>16. Testing of incoming goods and finished products</td>
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<tr>
<td>17. Concept and evaluation of cost of quality</td>
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<tr>
<td>18. Inspection procedure during production</td>
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<tr>
<td>19. Calibration system of measuring instruments</td>
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<tr>
<td>20. The system of production control</td>
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<tr>
<td>21. The status of production process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Product support (Handling, Storage, Packaging and Delivery)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>0%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Activity fulfillment (score) by the organization</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total**
- Quality and mission effectiveness:
  - 2. Implementation and warranty system
  - 2. Service readiness
  - 2. Inventory control

**Position:**
- Development
4. Analysis of the Findings

Through no general conclusion can be drawn from the findings of only 13 industries, the result roughly reflects low level of the quality systems practised by large and medium scale industries of Bangladesh. Out of 100, the average quality score of the industries is only 44.

In respect of QC circle activities, quality control audit, effort for customer feedback, calibration system of measuring instruments, inventory control, service facilities and warranty system, implementation of quality award, the situation is extremely poor.

Most of the organizations do not have any definite mission for quality improvement. That is why, management commitment regarding quality and hence quality relative activities could not develop.

Out of 13 organizations only three organizations practise QC activities in limited scales.

Very few industries provide facilities for education and training of their employees. Thus they are not exposed to the different quality improvement tools. None of the industries is aware of Design of experiments (DOE) the most powerful technique used for the reduction of variability of the product.
specification. Though many industries use basic SPC tools, they do not follow the proper procedures.

Out of 13, only two organizations have got ISO certifications. A few of them maintain national standard and the rest either followed their standard or do not follow any standard.

Out of 13, only 4 organizations have quality improvement team.

Provision for customer feedback is almost absent. Not organization directly or indirectly involves their customers during design and development stage. In fact, voice of the customer is not reflected in any phase of the production cycle.

Good working environment, safety and health care of the employees are considered most vital in quality development in developing customers. But in industrial organizations of Bangladesh, these two factors receive the best attention.

Most of the organizations hold a misconception that quality improvement activities increase the total cost. That is why, proper planning during design and development, prototype production to identify the major causes of defects, training and education for the employees, system for customer feedback etc which are essential to cut down the failure costs and thereby reduce the overall quality costs are considered wasteful efforts and usually ignored.
Because of the various problems discussed above, with a few exceptions, no 'quality climate' - the awareness among the employees startup from top management upto floor workers could not be created in the industrial organizations of Bangladesh and as such the level of them quality system stands quite low.
Chapter Five

IMPROVEMENT STRATEGIES FOR DIFFERENT LEVELS OF LARGE & MEDIUM SCALE INDUSTRIES

5.1 INTRODUCTION

The existing scenario of large and medium scale industries related to quality management as reflected from the survey findings is not at all encouraging. Out of 13 industries, only two organizations have scored 70 and above out of 100 points. Three organizations have scored around 50. But eight organizations have scored 45 and less. To improve this situation, specific strategies should be devised. But the same strategies can not be applicable for all organizations. This calls for grouping the organizations into different categories and levels. Problems and their solutions are likely to be different for different levels.

In this project study, depending on the scores of the quality determinants, five quality levels have been defined which are as follows:

<table>
<thead>
<tr>
<th>Type of level</th>
<th>Score</th>
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<tbody>
<tr>
<td>A</td>
<td>70 and above</td>
</tr>
<tr>
<td>B</td>
<td>60 - 69</td>
</tr>
<tr>
<td>C</td>
<td>50 - 59</td>
</tr>
<tr>
<td>D</td>
<td>40 - 49</td>
</tr>
<tr>
<td>E</td>
<td>39 - less</td>
</tr>
</tbody>
</table>
On the basis of the levels so defined the survey findings have been presented in graphical form in Figure-9.

![Bar Chart](image)

**Organizations**

**Figure : 9**

From the above figure, it is found that two organizations are in A-level, two are in C-level, three are in D-level and six organizations are in E-level. The following sections suggest various strategies appropriate for different levels for their quality improvement.

**5.2 IMPROVEMENT STRATEGIES**

**BASIS FOR ADAPTING STRATEGIES**

A quality system cannot operate in a vacuum. *The quality system must be integrated with other functional systems and provide the vehicle for cross-function responses to opportunities and challenges.* It is entirely possible to see an organization with a good quality system structure fail due to a lack of attention or success in integrating the quality
system with other systems in the organization. Typically, this integration will involve seven functional relationships: Marketing and sales, Product-process design; Purchasing and procurement; Finance and accounting; Production and production support; Product support and service and Quality assurance.

The set of strategies to be adopted and the subsequent activities to be carried out should directly or indirectly ensure these relationships.

Classification of the industries into different categories and levels, as shown above has by no means any strict objective basis. This only reflects the relative hierarchical level of quality systems of the industries. The real advantage of this categorization lies in adopting the strategies for quality improvement for specific industries.

The present research study includes only 13 industries of Bangladesh. The sample size is definitely quite low. So classification and adoption of strategies completely based on such a small size may not be acceptable from statistical point of view. That is why, the set of strategies for different levels as enumerated in the following sections, though has relation with but is not completely based on the findings of these industries. So it is definitely not a panacea for the industries to improve their quality systems, rather it should be viewed as a mere prescription of a quality path from the dismal level to the world-class status – where an industry can mirror
its relative position, engage in self criticism, analyze and improve itself on
the road to excellence.

**Improvement strategies for E-level:**

The industries in E-level are mostly characterized by their lack of
awareness of quality – top management has no clear mission, they have
the least commitment, provide practically no facilities for training of the
employees, value more on product quantity rather than product quality.

Steps of improvement strategies for this level have been presented in
Figure-10 and then discussed in brief.

**Figure 10 : Improvement steps for E-Level**

**Step 1 :** Create general awareness throughout the organization
about quality management:

**Step 2 :** Build a quality improvement team

**Step 3 :** Arrange training on statistical methods

**Step 4 :** Follow preventive maintenance method to reduce non-conformity

**Step 5 :** Emphasis on documentation

**Step 6 :** Provide adequate facilities for inspection and testing

**Step 7 :** Focus on product support (handling, storage, packaging and delivery)
The top management of the organization must come forward with a lot of promises & commitment. It should form a general committee consisting of personnel both from top and middle management. The main tasks of the committee would be to

- Examine the present status of all the sections of the organization regarding quality.
- Select one or more persons, depending on the structure and nature of the organization, from the committee for training on quality management. After completion of the training, the trained personnel will meet the committee members and enlighten them on the subject.
- Arrange a seminar/workshop on quality management involving all employees of the organization. The seminar should be conducted in a congenial atmosphere so that all participants can express their views freely and put suggestions. The objective of the seminar would be to create a companywide awareness about quality management.

**Step 2:** Build a quality improvement team:
The team should include people from the relevant departments. The members of the team will be trained in their respective fields. After training, each will form a working team in his own workplace and make necessary arrangements for in-house training. In order to ensure proper coordination among the departments, the members of the quality improvement team would meet once a month.

**Step 3  Arrange training on statistical methods**

From the working team of the production cell one or two persons should be given theoretical as well as practical training on basic SPC tools. They would in turn train the workers directly related to production through inhouse training.

**Step 4  Follow preventive maintenance method to reduce nonconformity:**

The organization should develop a preventive maintenance schedule and ensure that it is strictly followed by the relevant people. Periodic check up of the machinery and calibration of the measuring instruments, followed by corrective action if needed would suppress the recurrent variation in product specification, reduce machine breakdown and thereby increase overall productivity.
Step 5  *Emphasize on documentation:*

The production and material handling procedures, product specification, detailed instructions and other related information should be well documented. Any change in product design, technology, production methods etc. should be duly incorporated to update the documents. Documents should be easily retrievable.

Step 6  *Provide adequate facilities for inspection & testing:*

The quality improvement team would ensure proper inspection and testing facilities for the quality check of the incoming raw materials and the production process.

Step 7  *Focus on handling, storage, packaging and delivery:*

The relevant people should follow the rules and regulations provided for by the quality improvement team on handling, storage, packaging and delivery of the products.

**Improvement strategies for 'D' level:**

The overall condition of this level is slightly ahead of 'E level'. So in addition to the recommended strategies for E-level, the organizations of
this level should follow the steps presented in Figure 11 and then discussed in brief.

Figure 11: Improvement steps for D-Level
Step 1  **Appoint an external consultant:**

A quality expert from outside of the organization would be appointed as a consultant. He would help the management to set company's mission and vision more objectively, select proper quality standard, prepare quality policy and provide counseling to the quality improvement team.

Step 2  **Emphasize on training and education:**

Training and education programs should be given more emphasis. To improve the manpower, the organization must arrange training programs for all levels of employees.

Step 3  **Form QC circles:**

Initially QC circles should be formed in each relevant workplace among the workers, taking one of them as a leader. Each circle will identify and rectify specific quality related problems. A second level quality circle would then be formed involving the leaders of QC circles of the different workplaces, taking the foreman as the coordinator. Reports from the industries indicate that through the activities of the above QC circles, most of the lower level quality problems are solved effectively.
**Step 4**  *Improve the production process:*

It is found that the organizations of this level use outdated or obsolete machines. In most of the cases, machinery lose their accuracy. In order to keep pace with changing technology, management should give due emphasis on updating the machinery and applying new improved production methods. For this purpose, R&D activities should be carried out in respect of overhauling the machinery, purchase and set-up of modern machinery, product layout etc.

**Improvement Strategies for C-level:**

In addition to the ones prescribed for D-level, the organizations of this category should follow the steps of strategies presented in Figure 12 and then discussed brief.

![Diagram of improvement steps](image)

*Figure 12  Improvement steps for C-level*

**Step 1**  *Form QC circles and expand its scope:*
At this level QC circles will be formed at higher echelon. A first level QC circle will be formed involving the foremen, taking production manager as the leader. A second level QC circle will be formed involving production manager, marketing manager, purchase manager and others of the same hierarchy. A person from top management will act as the leader.

**Step 2 Establish company’s quality policy along with quality manual:**

The outcome of the activities of these QC circles (step 1) would in fact become the most effective tool for providing necessary preparedness to the organization in reformulating its mission and strategic decisions in terms of education and training, customer feedback etc.

**Step 3 Implement internal quality audit system:**

An internal quality audit system should be introduced under the leadership of the president himself. The mission and strategic decisions as defined in step-2 must be documented and sent to the heads of all departments of the organization. Accordingly planning and activities should be revised. There should be a constant follow-up and monitoring to check whether activities are carried out as scheduled. Periodic reports of the follow-up should be sent to the president for review and necessary action.
Improvement strategies for "B" level:

The organizations of this level are considered as quality conscious organizations. These organizations can easily improve their level towards "best" level through adopting the steps of strategies shown in Figure-13:

**Figure 13**: Improvement steps for B-level

**Step 1** Establish department for human resource development

Since quality control begins with education and ends with education, a department for human resource development should be established to continuously educate and update the skill of the employees.

Management executives must be exposed to modern management, marketing techniques and philosophies. Relevant people should be
trained on advanced statistical quality improvement tools like DOE and others.

Follow-up training program should be gradually introduced. Selected employees will attend training, go back to their work place and try to implement the acquired knowledge. After a certain period, they will be brought to the training centre to discuss their experiences. Their consolidated views will help trainers to modify and improve the training program.

Depending on the size of the organization, training on modular basis should be introduced.

**Step 2 Practise “Mistake Proofing” program**

At this level the organization should strive zero defects rather than adopt acceptable quality (defect) levels. To achieve this, besides adopting various techniques, the organization should declare a certain period to be “Zero defect” period. During this period, the management and the workers become more vigilant and circumspect on production. They put in special effort to produce “consistent” and “defectless” products, try to identify the root cause of variation from the customer’s “target” value, take appropriate corrective actions and keep close eye on all quality related activities. This is a proven practice to make the entire organization more quality conscious.
Step 3  Appoint consultant(s) for QC audit:

An organization can appoint a consultant / consultants for QC audit. In this system, consultants examine and evaluate the entire quality system and make necessary recommendations and suggestions. The organization through this audit gets a clear picture of its performance and can take improvement strategies to enhance its competitive edge.

Step 4  Create environment to get ISO certification

National and international recognition of the quality systems employed at the company is increasingly seen as an essential prerequisite to international trade. So the company at this level must undertake steps of activities to satisfy the necessary requirements to get ISO accreditation.

Step 5  Introduce Customer feedback system

"Profit worship must give way to customer worship". If customers are truly satisfied, profits should automatically follow. 'Bring customer home' is the well known campaign in Japanese industries. Starting from design and development to packaging, customer's voice must be reflected in all phases of production. This calls for a well planned customer feedback system. In the modern business world this is considered as one of the
most effective weapons in extending customer horizon and maintaining competitive edge.

**Improvement strategies for 'A' level**

Quality improvement is a continuous and endless process. But looking at the advanced quality planning it can be stated that as organizations develop, the emphasis changes from the control of the process to the design. *Designing products and processes in which quality problems are prevented rather than directed is not only more cost effective, but also produces more consistent products and services.* The organizations categorized as A-level are considered already mature in terms of quality development and as such prevention-oriented techniques dominate. In order to apply these techniques the organization needs not only to put in constant efforts to achieve the benefits of the methodologies of the modern development fronts like JIT, FMS, CIM etc. but also have clearly defined customer requirements, a clear understanding of material variability shorter product life cycle and product diversification, an established culture of team working and a passion for improvement.
Chapter Six

STATUS OF SMALL AND COTTAGE INDUSTRIES REGARDING QUALITY MANAGEMENT

6.1 INTRODUCTION

The small and cottage industries are usually footloose with short gastation period and complements with larger industries. These industries are available on their own for almost countless production processes which are not scale sensitive. They depend on simple technologies using simple machinery and equipment. They do not consume substantial energy and infrastructural inputs; their requirement of capital and managerial, technical and other skill to operate and management technology are low. But their strategic existence and fosterence in the form of promotion of SCI sector is necessary for the following positive foreseeable benefits.

i. A large employment generation potential for poverty alleviation.

ii. Strong forward and backward linkage permits efficient division of labour, specialization and cost reduction through sub-contracting arrangement.

iii. The simpler production skill permits use of local labour force, specifically the women work force. This would enhance socio-economic development and self reliance.
iv. Relatively smaller size firms having a closer and improved human relations may yield better productivity.

v. Indigenous resources can be utilized both in small local markets and large urban markets and can effectively meet needs of segmented market with differential consumer prices.

vi. Locational flexibility permits wide geographical dispersal and balanced regional/sub-regional economic development.

Apart from these above mentioned benefits which could be derived from SCI that the contribution of small scale manufacturing in Bangladesh is about 35% of total manufacturing GDP of the country\(^{121}\). But this prosperous situation is now challenged and subject to threat by incoming of foreign products due to free market economy. Indigenous products could not be able to compete with foreign products due to quality and cost. Considering this important point, proper quality management is only the way to survive in present business arena for SCI sector. In the latter articles, present conditions about QM and improvement strategies for SCI sector will be discussed.

### 6.2 METHODOLOGY OF SURVEY

The methodology of survey the SCI sector is like that of large and medium scale industries (LMI) but somehow different. The organizational structure of SCI is different from that of LMI, capital worth of SCI sector very much
lower than that of LMI. So the management functions are different in two cases. But the basic theme of quality management may be the same. Considering the above things a questionnaire has been formed which covers the areas production process, marketing, training and education, testing and inspection, documentation methods etc. to survey the SCI sector.

6.3 CURRENT STATUS OF QUALITY MANAGEMENT SYSTEM:

A questionnaire survey has been conducted on a number of small and cottage industries similar to that of large and medium scale industries. The responses have been analysed and presented in graphical forms (Figure 14 to 23). Very few firms use feedback mechanism to collect the customer's reactions (Fig. 14). About 50% of these firms do not consider customer's opinion would help improve the product quality (Fig. 15). Less than 40% of our industrial units feel to improve the quality (Fig. 16), while more than 60% are satisfied with their current product quality.
Impact of free market economy has been measured in terms of internal market share and is presented in Figure 17. According to responses, it is observed that market share of more than 75% of the surveyed units is declining. Higher percentage of the rest are experiencing constant demand while a very small fraction is finding an increase.
Standard inspection and testing procedures using various measuring instruments are to be followed in controlling the quality of the incoming raw materials. In this area a discouraging picture is shown. More than 75% of the units do not adapt any standard procedure (Fig. 18), rather based on physical appearance as observed by bare eye is followed. The rest claimed that they use some sort of measuring instruments.

Only 40% of the units using some measuring instruments have claimed that they set some target for quality (Fig. 19). But the standards they set as targets are mainly of their own, not from any standard organization (Fig. 20). Only a small fraction adapt BSTI standard.

![Fig 18: Testing procedure of raw materials](image1)

![Fig 19: Target on quality set by management](image2)
About 78% of the surveyed units do not have any employee training scheme (Fig 21). The rest are very poorly equipped with any kind of such scheme.

As shown in Fig. 22, 90% of the small and cottage industries do not use any kind of SPC tools for process and production control, the rest have limited practice.
The essential element of proper documentation procedure for maintaining and upgrading the quality level of the products is almost absent. More than 95% do not maintain records related to quality while the rest maintain very loosely. The statistics are shown in Fig. 23.

Other findings of survey can be summarized as follows - these are not ranked in order of importance.

- Poor communication between the various levels of management
- Poor quality of materials from vendors
- Company practices inconsistent with quality goals
- Poor performers
- Arbitrary standards of quality maintained
- Lack of measures for quality
- Fear about excessive costs with quality improvement
- Inefficient usage of facilities
- Lack of awareness about quality at management

From the foregoing discussion, it is clear that the overall condition of SCI sector about quality management is gloomy. But, it is possible to change the situation adapting some necessary measures in each unit. The following chapter will discuss the strategies required to improve the quality level of SCI sector.
Chapter Seven

IMPROVEMENT STRATEGIES FOR SMALL AND COTTAGE INDUSTRIES

7.1 INTRODUCTION

In present business arena, quality is the main weapon for a company to compete with its competitors. The scenario of small scale industries in Bangladesh about quality is dismal. This situation should not be allowed to sustain any longer. From this stage, SCI sector should be escape as quickly as possible. In this regard co-operative and supportive programmes should be undertaken by BSCIC and Government with and for the companies (units) The target objective(s)/goal(s) would be to strengthen the SCI units to enhance their capabilities to achieve the ultimate 'world-class' quality. These programmes would yield directions of action programmes to be undertaken at factory level.

7.2 Required Strategies in Each Unit to Enhance Quality Management:

Each of the unit of SCI should emphasize on the following specific factors to strengthen quality management system.
Technology

Small and cottage industries should be equipped with the current technology. Presently most of SCI are using obsolete machineries. For SCI to be able to successfully compete in the free market it is imperative to update their technology. In this regard effective BMRE process may be started.

Workers' skill

Workforce in the SCI units is mostly unskilled. These people are not conscious and aware of 'quality'. More over, with the introduction of modern technology it is likely that the demand for skill manpower will be even more greater. Some SCI units are equipped with modern technology but they suffer from lack of trained manpower. To alleviate this situation the unskilled labour force should be elevated to become skilled workforce through proper education and adequate training. In this regard following activities should be performed:
* Workers should be trained through in house training programmes. This programmes would include basic process control tools, process capability indices etc.

* To create improved working environment, QC circle activities should be started even at the workers level.

**Management**

Management plays an important role toward quality management and production of quality goods. Management of a company should adapt the Total Quality Management (TQM) approach as quickly as possible. TQM concept has proven to be the most effective in the current quality movement. In simple term TQM can be thought of as "involving everyone and all aspects of an organization in continuous improvement through teamwork"[13].

To improve the management of quality, SCI units should conduct the following activities:

* Management should have clear vision of quality and customer satisfaction.

* Form a quality improvement team within the company with personnel from each department.

* Management should create a quality culture throughout the organization.
Management should emphasize on quality audits and documentation procedure.

Raw materials

Proper quality of raw materials is a precondition to produce quality product. Most of the small and cottage industries units have no adequate facilities to check the properties of raw materials and no trained person for this purpose.

To get good and proper raw materials the SCI units should take the following steps:

* Accept raw materials from enlisted vendor/vendors who follows/follow the quality control activities.
* Test the raw materials using appropriate equipment.
* Control the vendors applying adequate knowledge of SPC by experienced person.

Product Support

To retain product, quality handling, storage, packaging and delivery of products are very important.

The finished products should be handled and stored such a way as to prevent damage or deterioration, should take care in protecting the
products during delivery to the market. SCI should be concerned on these matters and train the people who perform these activities.

**Quality system standard**

Quality System approach should be adopted for SCI. This leads to generalized standard comprising of the organizational structure, responsibilities, procedures and resources for quality management implementation. In Figure-24, the basic elements and their dimensions are presented.

![Diagram of quality system elements and dimensions](image)

**Fig. 24 : Typical elements and dimensions of quality system**

This system approach provides a general framework for assessing a company's quality system, an independently verifiable checklist. The following issues are necessary to be resolved for ensuring a standard system:
* define who are responsible for what tasks
* define the methods and process description and supply them to the related work place
* define record keeping procedure
* train the persons who are responsible for auditing and record keeping

**ISO Standard**

ISO is an organization for international standardization. It provides various standard management systems which are accepted all over the world. About 135 countries including most of the developed countries believe that its provided standards are able to meet the international demand. It works for continuous improvement. Now it is almost impossible to enter into the global market without ISO certification. SCI will have no other alternative but to come under the umbrella of ISO.

To get ISO certification, SCI must follow the following steps

* Establish management commitment and responsibility
* Provide quality plans
* Practice proper documentation system
* Provide training, education and quality awareness throughout the organization
* Implement auditing and corrective actions
* Prepare quality assurance manual
* Go for certification through formal ways.

QC circle activities

QC circle is a small group to perform quality control activities voluntarily within the same workplace/workshop. QC circle activities because of their inherent cost effectiveness and scope of participation of the employees at all levels in quality decisions, a favourable TQC climate will be generated in an organization.

The basic ideas behind QC circle activities carried out as part of company-wide quality control activities are:

a) Contribute to the improvement and development of enterprise
b) Respect humanity and build a worth while-to-live-in happy and bright workshop.
c) Exercise human capabilities fully and eventually draw out infinite possibilities.

To establish QC circles, managers and quality control personnel should study more about QC and QC circle activities. They must attend QC circle conferences and visit industries and companies that are implementing QC circle activities. Make provisions for foremen and future circle leaders to have these same opportunities. Producing QC circle leaders, circles may be formed with people in the same work places.
After studying and gaining a basic understanding of quality control, the members of circle would start their activities selecting common problems.

**Free Market Economy**

Reduced

**Market Share of SCI**

Because of:
- Increased competition
- Poor quality of product
- Unskilled manpower
- Lack of management commitment about quality
- Unawareness about quality through organization
- Lack of knowledge about quality control

**Present Scenario**

Should go for:
- Training & education for manpower development
- Using modern quality management philosophy
- Using appropriate technology
- Focussing on customer satisfaction

**Action Program**

Take assistance from:
- BSCIC**, BUET, BAAS, BSTQM etc.

**Standard Organizations**

Implement:
- TQM concept
  - Inhouse training program
  - Quality control techniques
  - Appropriate Technology
  - Appropriate production process
  - ISO-standards

**Result**
- Reduced non-conformity
- Quality goods
- Reduced total costs
- Increased productivity

**Benefits**
- More profit
- Increasing market share
- Customer satisfaction
- Strong in competition

**Long-run Perspective**

**Fig. 25**: Present scenario and required activities of SCI units with respect to Quality
Each of the SCI units must practice QC circle activities. These activities will create quality culture throughout the organization to implement TQM.

The Overall Scenario and required activities of each SCI unit regarding quality control can be depicted by the Figure 25

7.3 Role of BSCIC to Enhance Quality Management System in SCI Sector

As previously mentioned the role of BSCIC would be quite extensive and far reaching. The overall role and scope should encompass training to entrepreneurs on quality, developing the quality standards, providing assistance in selection of modern technology. Following are the areas where important contributions would yield desired results:

- Training on "quality control" and "quality management"
- Developing quality standards
- Quality of raw materials
- Technology selection and development, transfer and adaptation
- Creating scope for product diversification
- Development of entrepreneurship for twenty-first century

Training on "quality control" and "quality management"

Training on 'quality control' and quality management should focus on the following areas:
* Quality cost management
* Education & training for quality control (QC)
* Quality control circle activities
* Quality control audits (internal & external)
* Quality assurance
* Application and utilization of elementary SPC tools.
* Data collection methods for customer satisfaction
* Preservation of quality records
* Control of non-conformity
* Inspection and testing procedure
* TQM practice/CWQC
* Maintenance Management
* ISO-9000 and other International standard.

Developing quality standards

Quality standardization in terms of quality specification is a very important aspect for a manufacturing unit. From the scenario of SCI, it has been clear that most of the organizations do not follow any standard. But in a free market economy this situation should not continue. Therefore, SCI should adopt national standards as well as international standards. BSCIC would provide support in this respect. It would formulate in collaboration with BSTI quality specifications and standardization system for SCI. BSCIC would encourage and monitor the industries so that the system is used effectively.
Quality of Raw Materials

Quality in raw materials which account for a major component of the total cost is therefore an important area of TQM. To achieve quality standard in raw materials BSCIC can play vital role taking the following steps:

- Develop facilities to carry out tests on raw materials; also provide guidance to avail of existing testing facilities from other appropriate organization/institution.
- Educate & train on properties of materials, their handling and preservation to the people related to quality control.
- Supply specialized raw materials for selected units.
- Generate a group of competent suppliers for selected units of SCI.
- Provided support to establish links between producers and suppliers.

Technology selection and development, transfer and adaptation

BSCIC would take the following steps in technology selection and development, transfer and adaptation of SCI:

1. Assessment and evaluation of technology use scenario and make technology forecast in certain strategic sectors for development
2. Providing technological assistance in terms of machinery and management support, on priority basis, to the different categories of industries, specially those having high local market share such as food and allied products, Textile, Apparel, Leather etc.
Creating scope for product diversification

In free marketing economy environment, the SCI will lose their competitive edge in respect of market share without product diversification. For this, BSCIC should play a vital role in respect of technology, marketing and manpower development.

Development of entrepreneurship for Twenty-first century

BSCIC has been pioneering to support the existing entrepreneurs and develop new entrepreneurs in SCI. But with the current economic system where quality is of prime consideration BSCIC will have new additional responsibilities as follows:

i) Evaluate the performance, with special emphasis on quality, of the existing entrepreneurs and take actions as follows:
   * Provide organizational support to sustain quality manufacturing
   * Encourage and support those amongst existing entrepreneurs with innovative ideas pertaining to entirely new design of marketable products or manufacturing process use of new materials etc.

ii) BSCIC would formulate policies to develop new entrepreneurship from amongst the following:
   * Graduates (unemployed) in engineering, finance, accounting, marketing, management and economics with brighter vision and outlook toward business.
   * Non-graduates with positive motivation, promise and energy
These entrepreneurs would be guided by BSCIC. It would provide long
 term financial, technical and other supports to these entrepreneurs.

This new class of entrepreneurs of the SCI, it is expected that, with their
creative thinking, knowledge about current technology and business will
contribute toward world-class quality manufacturing in the long run.

The Overall activities of BSCIC to enhance quality level of SCI units can
be depicted in Figure 26.

![Diagram of BSCIC's role and activities](image-url)

**Fig. 26**: Role and activities of BSCIC to improve overall quality of SCI sector
Government can play a vital role to develop the quality management system of SCI sector. First of all, it can strengthen BSCIC to expedite its programs towards SCI sectors in different areas. Moreover implementing national quality policy rationalized tariff structure etc. Government can contribute a lot for the improvement of quality level of SCI sector. However, the overall conclusions and recommendations for large and medium scale industries as well as small and cottage industries have been discussed in the last chapter of this thesis paper.
Chapter Eight

OVERALL CONCLUSIONS & RECOMMENDATIONS

8.1 CONCLUSIONS

The impact of Free Market Economy and that of globalization and liberalization of trade has been significant on the industrial sectors in general. In effect it has been observed that the overall scenario of both large and medium scale industries and SCI units in terms of quality management activities are not very encouraging. The present research study reveals this current status. Some of the major findings from the study are now presented below:

i. Lack of awareness and commitment of the top management exists towards quality management in most of the organizations.

ii. Very few LMS industries have ISO certification. More than 75% of SCI units do not use or adapt standard procedure for quality management.

iii. Most of the organizations are either unaware about statistical process control techniques or do not follow appropriate procedures. About 90% of SCI units do not use any kind of SPC tools.

iv. Scarcity of skilled manpower is a common feature in almost all industrial units.

v. Most of the industrial units use outdated and obsolete technologies.
vi. In SCI unit, raw materials of appropriate specifications are seldom used.

vii. Education and training systems are not adequate in most of LMI units. About 80% of the SCI units do not have programmes to train their employees.

viii. Most of the units lack in clear understanding with no set of vision/mission in terms of profit maximization/wealth maximization, customers' satisfaction, product diversification etc.

ix. Inspection and testing facilities are poor in most of the organizations.

x. Only few LMI organizations practice proper calibration for measuring equipment.

xi. Proper documentation and recording system are poor in most of the organizations.

xii. Few organizations in the LMI sector practise QC circle activities.

xiii. Most of the organizations have no quality control audit system. Recently some of the LMI units started practising this in the limited scale.

xiv. Myth and misconception about quality improvement that overall cost increases with the quality improvement is present in most of the organizations.

xv. Customers feedback systems in areas such as product design and improvement, product diversification etc. are almost absent.
xvi. Institutionalized support and "Guardianship" of Government and BSCIC in terms of training and manpower development, R&D, technological development etc. towards SCI are almost missing.

8.2 RECOMMENDATIONS

8.2.1 Recommendations for LMI Sector

To recommend strategies for quality improvement for specific industry in the LMI sector one should be very cautious to identify first the current status of its quality management system. It is possible by applying the methodology developed in this research study. Accordingly specific strategies will be recommended. However, considering the overall situation, the following few major recommendations may be suggested for LMI units.

1. Create general awareness of quality management throughout the organization
2. Build a quality improvement team
3. Arrange training on statistical methods
4. Follow preventive maintenance method to reduce non-conformity
5. Emphasis on documentation
6. Provide adequate facilities for inspection and testing
7. Focus on product support (handling, storage, packaging and delivery)
8 Appoint an external consultant

9 Emphasize on training and education

10 Form QC circles at different levels

11 Improve the production process

12 Establish companies' quality policy along with vision and mission

13 Implement internal QC audit system

14 Establish department for human resource development

15 Practise “Mistake Proofing” program

16 Appoint a consultant for QC audit

17 Create environment to get ISO certification

18 Introduce customer feedback system

8.2.2 Recommendations For SCI Sector

A number of major strategic steps are necessary to improve the quality management of SCI and thus to bring about dramatic improvement. In this respect SCI, BSCIC would have some specific roles and responsibilities. These are outlined below in two specific headings respectively.

Recommended activities for SCI:

i) Create facilities for training and education: Selected management and supervisory personnel may be trained from relevant organizations on quality management. These trained personnel on
their return would be in a position to organize/conduct in-house such programmes in their own units. A “training cell” at unit level may be formed for this purpose.

ii) Establish QC circles

iii) Ensure the procurement of quality raw materials.

iv) Follow national/international standard on quality specification and quality management.

v) Use appropriate process control tools.

vi) Adapt proper technology in manufacturing.

vii) Ensure required product support (storage, handling, packaging and delivery of products).

viii) Establish quality culture movements inside the organization to adapt TQM.

Recommended activities for BSCIC:

i) Create computerized data bank for all units of SCI for proper monitoring and coordination.

ii) Provide coordinated training facilities to SCI units.

iii) Encourage and monitor the quality management activities of SCI.

iv) Provide assistance and support to establish and develop testing facilities in the private sector.

v) Provide technological and other supports (R&D, technology management, product diversification etc.)
vi) Develop entrepreneurship to cope up with new trend of international trade and business.

vii) Provide assistance and support selected SCI units to develop "Model Quality System". These units will demonstrate quality systems as example to others.

viii) Arrange programmes (seminars and workshops) to increase awareness amount SCI entrepreneurs on quality.

ix) Arrange publications on regular basis of Technical digest, Report, News letters etc. on quality management, technology development and their success stories.

8.2.3 Recommendation for the Government for both LMI and SCI units to expedite the system throughout the country:

1. It can provide the "National Quality Award" for quality organization.

2. It can take "National Productivity Program" conducting awareness seminars for trade union officials employees and managers, media personnel & other groups.

3. It can develop 'National quality Policy' with strong legislation about consumer products.

4. BSTI might be accredited to give the ISO certificate to the standard organization.

5. It should rationalize the tariff structure for import & export of both raw materials and finished goods and also in procurement of technology and their management.
6. Strengthen BSCIC in term of budgetary allocation for successful implementation and sustainance of recommended proposals for BSCIC.

7. Provide award system especially for the SCI unit, at the same time it is recommended to take measures against those who do not comply with the agreed quality. This is required to project consumers' right.

8.3 Scope for further research:

The conclusions and recommendations made in this research study are based on the survey findings. As mentioned earlier, the sample sizes both for LMI and SCI units were relatively small. In order to make a comprehensive analysis for appropriate improvement strategies for the quality systems of the various industries, a large scale survey should be conducted. In this respect, knowledgeable and experienced personnel form the industries should be involved to construct questionnaires.

The Classification procedure as suggested in the present work was based on the scores of certain quality determinants awarded to an organization. The purpose was to assess the quality management system of the organization. This classification system, although more biased toward subjectivity, yet it would find useful application in quality practice. This subjectivity may be reduced through further work.
A further research study may be undertaken to establish a relationship between the quality level of an industry and the quality determinants. This calls for a regression analysis with the quality management level as the dependent variable and the set of quality determinants as the independent variables. For this purpose, some measurable quantities related to profit, sales volume, rejection rate, machine breakdown, customers’ complaints, salary structure, employee turnover etc. are to be assigned relative weights and an average single value of the dependent variable is to be determined. However, before conducting such analysis, a well documented recording system must be ensured.
APPENDIX

FINDINGS OF THE SURVEY

Organization 1

1. Two seminars on "Quality Management" were arranged in the factory premises last year.
2. General meeting including all employees from Director to Line Workers is held twice a year.
3. A meeting of the supervisors is held in the quality control department on Saturday every week.
4. There is a quality improvement team.
5. The members of the quality improvement team are from management level (GM factory, QC Manager QC department, Factory Manager).
6. There is a well documented quality manual.
7. The companywide policy of the company is to supply the best products and services to meet customer satisfaction.
8. The corporate mission of the company:
   - To pursue to operate as a market oriented company
   - To ensure quality product and service excellence for total customer satisfaction
   - To endeavour for constant enhancement of technical and professional skills of the employee
   - To maintain high ethical standards in all areas of operation
   - To respect the social norms and customers and contribute to welfare of the society
9. The vision of the organization is to produce defectless products.
10. There is no formal training system for workers & supervisors.
11. An engineer has been sent to Japan under the AOTS programme to have "hands-on" experience on TQM implementation.
12. The defective products are exchanged by good ones on the basis of terms and conditions.

13. Payment of Indemnity is performed only for reputed dealers.

14. The company has an well-structured customer service department equipped with qualified engineers and technicians to handle customer complaints.

15. There is no system for product development.

16. The organization has no QC circle.

17. There is an internal quality audit system which is performed by QC staff.

18. External Quality control audit was performed before gaining ISO certification but there is no regular audit system.

19. External auditor was a consultant M/s. Orion, Registrar Inc. USA.

20. Check sheet, control chart and pareto's law are used as statistical methods.

21. Raw materials & pure lead are purchased from Indonesia and Australia, Lead from Malaysia, Separator from Italy and other European countries. The container of Battery is manufactured by company own.

   - Purchasing Manager (Grade in MBA & experienced) is responsible for procurement.
   - There is no contract with vendors about QC.
   - Materials are purchased on the basis of reputation of vendors.
   - Quality of raw materials is ensured by the QC manager.

22. Documents are preserved in two different ways, one for current documents and another for obsolete documents. Current documents are preserved in separate files which are continuously updated.

23. There is no direct system to take customer feedback but any complaint related to products is received through dealers or whole sellers.
24. Service is provided free to the customers during warranty period.

25. The organization holds the conception that the total quality cost is reduced when quality improves.

26. The organization could not give actual figure about the loss for non-conformance.

27. International standard is used for testing.

28. Products are inspected both during production and after production.

29. Period and random sampling methods are applied for inspection.

30. Finished products are stored in the warehouse under normal atmospheric condition.

31. ISO standard is applied for product support.

32. Semi-automatic as well as obsolete machinery is used for production in different lines.

33. There is no involvement of customer in design and development.

34. The manager for QC has been trained from abroad. He is an engineer. Now he monitors all the QC activities. There is no permanent consultant in this regard.

35. There is no clinic inside the organization. A fixed amount is given to the employees for the purpose of health care. Overall working environment is good.

36. The organization has got ISO-9002 certification

37. There is no formal quality award system.

38. The organization is trying to implement JIT concept for inventory control.

39. Workers involvement in decision making on QC is rare.

40. The organization is trying to implement fully the TQM concept.

41. A fixed money is rendered to each employee for health care.

42. There is a well equipped QC department.
43. Prevention method is applied for handling of non-conforming product.

44. Impediments to implement modern quality management techniques are:
   i) Poor literacy level of the workers
   ii) Lack of adequate knowledge on modern philosophy in Top management
   iii) Incompetent and erroneous communication among different levels
   iv) Lack of adequate training
   v) Absence of strong loyalty of employees
   vi) Mental conflict between top and middle management.

Organization 2

1. Two seminars and a workshop were conducted last year including all department heads and team leaders
2. Two personnel have been sent abroad for the training on quality control
3. There is a quality improvement team which includes GM of QC department and the department heads of all sections.
4. There is a definite quality manual.
5. There was a consultant for a definite period before accepting ISO certification. Mr. Peat Marwick (Assessor of KPMG) was the consultant.
6. The organization has a well equipped quality control department.
7. There are in-house training programmes for supervisors and workers.
8. Basic SPC tools are used
9. There is no QC circle.
10. Internal quality control audit is performed by QC staff.
11. External quality control audit is performed by ISO representative.

12. The documents are preserved in a controlled way. They are easily retrievable.

13. The organization has got ISO-9001 certification

14. The mission of the organization is to achieve business excellence through quality by understanding, accepting, meeting and exceeding customer expectations.

15. The organization collects data about customers’ satisfaction and dissatisfaction using printed forms.

16. The organization holds the concept that quality improvement decreases the cost.

17. Preventive method is applied for handling the non-conformance.

18. Modern measuring instrument is used for testing the products. International standard is followed for testing.

19. Periodic as well as random sampling inspection is applied during production.

20. Calibration is performed according to the rules of ISO standard.

21. Semi-automatic with modern machinery are applied

22. The production is controlled on the basis of documentation, batches and proper identifications.

23. ISO standard is followed for product support

24. ABC model is applied for inventory control.

25. Finished products are stored in controlled atmosphere.

26. There is a system for the payment of Indemnity.

27. There is no quality award system.

28. The organization could not be able to implement TQM concept.

29. Impediments of the organization to implement TQM concept:
   - Shortage of capital for huge programme
   - Law level education in workers level
• Lack of experts
• High rate of taxation on raw materials
• Lack of education and training systems for all.

Organization 3

1. Only one seminar on quality management was held in the company premises last year.
2. The Chairman of the company went to Japan for training on quality management.
3. Two managers have been trained from BSTQM on quality management.
4. There is no quality improvement team.
5. There is no quality manual.
6. There is no consultant.
7. The organization has no quality control department
8. There is an in-house training programme for QC leader which is directed by Company Chairman. They are trained by company chairman who is trained up from abroad.
9. The organization uses some basic SPC tools
10. There is no contract between the suppliers of raw materials and the organization on QC activities. Raw material is purchased on the basis of reputation.
11. There is no formal internal or external quality control audit system
12. Documents are preserved in each of the department using separate files for current & obsolete records.
13. The organization has not got any ISQ certification. It follows national standard.
14. It has a plan to get ISO certification within five years.
15. There is no clear cut company policy, mission and vision.
16. There is no definite method to take customers feedback sometimes complaints is collected from the dealers informally.

17. The organization believes that the total quality cost is decreased when quality improves.

18. About 2.5% is lost due to scrap and waste.

19. There is no modern testing facility to check the raw materials. Finished products are tested by measuring instrument like, voltmeter, Ammeter, power meter, weight meter etc.

20. Periodic sampling is performed in most cases. For some products 100% inspection is performed.

21. Calibration for measuring instrument has not been performed for more than two years.

22. The production is controlled through documentation and proper identification.

23. Production process is semi-automatic with modern machinery.

24. Product support is performed according to company standard.

25. Inventory is controlled on the basis of experience.

26. Finished products are stored in normal atmospheric condition.

27. There is one year warranty system the products with free service.

28. There is a quality award system for QC circle. The best working and for the best performer.

29. There are 14 QC circles in the organization.

30. The working environment is so far good.

31. There is no clinical treatment system within the organization. A little amount of money is offered for the employees for health care.
32. There is a positive attitude towards costs of quality but no methodology to evaluation.

33. The impediments of the organization for quality management
   - Low level of education in workers level
   - Lack of capital to provide training system
   - Lack of QC expert on statistical methods.

Organization 4
1. No seminar on QM/QC was arranged in factory premises.
2. There is no quality control department. No person is sent to abroad for training.
3. There is no quality improvement team.
4. There is no quality manual.
5. No consultant is appointed for QM/QC.
6. Maintenance engineer is responsible to ensure quality of the products
7. Only vendor is responsible for the quality of raw materials
8. There is no system for formal education and training.
9. New employees are trained by respective supervisor on the basis of his experience.
10. The organization uses some elementary SPC tools.
11. There is no quality control circle.
12. There is no internal or external quality control auditing system.
13. The organization has no ISO certification and it does not work for it.
14. There is no definite quality policy, vision and mission.
15. There is no system for customer feedback. If customer complaints it takes necessary actions.
16. There is no customer involvement in design and development.
17. Preventive method as well as rework system is applied for the handling of non-conforming product.
18. Modern testing equipment is used.
19. Calibration is performed periodically.
20. Periodic sampling inspection is performed during production.
21. Inspection is performed in both during production and after production.
22. It does not care for the implementation of ISO standard. It follows national standard.
23. Company's own standard is used for product support.
24. It does not so conscious for inventory control.
25. Finished products are stored in a controlled atmosphere.
26. 100% inspection is performed during production and sampling test is performed for finished products.
27. Warranty of two years with spare parts is imposed to selling products.
28. Documents are preserved in selected units but haphazardly.
29. There is no clinical facilities for employees within the organization. Financial aid is imposed to employees.
30. There is no system to exchange the defective products by good ones.
31. There is no quality award system.
32. The organization does almost nothing for health care for employee. A part time doctor come to the factory for check up.
33. There is no system to involve lower level employees in decision making about QC.
34. There is a misconception about quality cost.
35. Impediments of the organization for implementing quality management.
   • Lack of management executives
   • Lack of quality experts
   • Lack of education and training
   • Communication gap between different levels.
Organization 5

1. No seminar on "Quality Control" was arranged by this organization (in the last years).
2. There is a quality control department including five personnel.
3. An inspector (quality control manager) inspects the products during production and as well as after production taking random sample.
4. Check sheets and control charts are used as statistical process control technique.
5. Calibration of measuring/testing equipment has not been performed for five years.
6. Documents about quality of the product are reviewed and approved by the quality control manager.
7. Documents are preserved by the quality control department (about quality), are preserved by production managers (about production) and are preserved by the office of factory manager (overall) but not in systematic way.
8. There is no external auditor of this company.
9. The main supplier of the raw materials is Philip's mother company (Philips Holand Ltd), so the organization does not care about the criteria of the supplier.
10. Incoming goods are inspected visually by QC inspector.
11. There is no system to collect the data about customers' satisfaction and dissatisfaction.
12. One years guarantee (warranty) is imposed on product to customer.
13. Service strategy is to replace the product if it failures during guarantee period.
14. Quality control manager himself is a trainer (quality expert). He is trained up from BSTI & from Holand.
15. Basically there is no training system for supervisors/worker, they are informally trained up by quality control manager.

16. Only preventive method is applied to reduce non-conformity.

17. There is no quality circle in any section.

18. There is no systematic meeting system about quality, it is rarely performed by the quality control department.

19. There is no quality improvement team.

20. The vision of the organization is to produce more products and to increase the sales volume. The mission of the organization is to increase the facilities of the production and for this purpose it is going to full automation. The quality policy is preserved by the management.

21. The organization have no ISO-certificate. It is expected to get the certificate.

22. It is unaware about DOE.

23. It holds positive attitude about quality costs.

Organization 6

1. No seminar on quality control has been arranged in the company yet.

2. There is a quality control department including six employees.

3. Inspection is performed during production.

4. 100% inspection is performed.

5. Only check sheet is used as statistical process control technique.

6. There is no proper calibration system of testing equipment.

7. Factory manager approves all the documents related to production.

8. Documents are preserved haphazardly.

9. There is no external auditor for this company.

10. The main raw material (coil) is purchased from Japan.
11. Incoming raw material is ensured by factory manager, he is a graduate engineer with ten years experience.

12. Company's own standard is applied for testing incoming and finished product.

13. There is no system to collect data about customers satisfaction/dissatisfaction.

14. There is no warranty for the products.

15. There is no quality experts.

16. Only preventive method is applied to reduce non-conformity.

17. There is no training system for workers or supervisors.

18. There is no quality circle.

19. It does not think about the product's quality. It think its product is good enough.

20. It holds misconception about quality costs.

21. There is no quality improvement team.

22. The mission of the company to produce more products and to increase the sales volume. The vision and the quality policy are preserved by the management.

23. It does not work for ISO certification. It follows national standard.

24. There is no awareness about DOE and statistical process control techniques.

25. Inspection is performed periodically during production.

26. Impediments to implement quality management in this organization are:
   - Lack of awareness in management level
   - Lack of capital
   - Company's over satisfaction about their present market share in local market
1. No seminar on quality control or on quality management has been arranged in the company yet.

2. There is a quality control department with well equipped laboratory.

3. Inspection is performed during production. Finished products are also inspected.

4. PDCA, check sheet and control chart are used as statistical process control technique. But the users have no textual knowledge about them.

5. Physical and chemical properties of the products are being tested batchwise.

6. There is no proper calibration system for testing equipment.

7. Chief manager is responsible to review and to approve the documents.

8. Documents are preserved departmentwise but haphazardly.

9. External auditor of this company is the representative of Netherlands development Finance company.

10. There is no system to collect data about customers comments about products.

11. Managing Director and Chief Manager of the company are quality experts. They are trained up from Japan.

12. Occasionally awareness meeting for quality management is arranged for executives and production personnel. But there is no particular training system.

13. There are 18 (eighteen) quality control circles in the factory.

14. Each section's QC circle holds weekly meeting with the leader and members.

15. Managing Director, Director Production, Chief Manager, Manager Production and all leaders of the QC circles are the members of 'quality improvement' team.
16. The vision of the company is to produce quality product for customers' satisfaction.
17. The mission of the company is – "Quality is to be inflicted into all processes sections and departments to achieve the goal."
18. The company has no ISO-certification.
19. It is unaware about DOE.
20. It is practicing the concept of 5-S, QC, CWQC, TQM & ISO-9000.
21. To reduce idle time of machine, preventive maintenance system is being practised.
22. Periodic sampling is applied for inspection during production.
23. PDCA cycle is being practiced for quality improvement.
24. It holds positive attitude about quality costs but there is methodology for evaluation.
25. Impediments for implementation of the 5-S, QC circle and TQM in this organization are:
   • Poor literacy level of the workers
   • Lack of adequate in-house training facilities.
   • Misunderstanding about quality cost in top management level.
   • Employees are devoted to gain their own aims.

Organization 8

1. The organization has a quality control department with a testing laboratory.
2. No seminar is held in the organization on QM.
3. No person has been sent abroad for training on QC/QM.
4. There is no quality improvement team.
5. There is no quality manual.
6. There is no consultant on QC.
7. There is no formal training and education system.
8. New employees are trained informally in respective fields.
9. Some elementary SPC tools are used.
10. There is no QC circle
11. Raw materials is procured from different vendors
12. There is no quality audit system
13. Documentation system is haphazard and records are preserved in QC department only.
14. It does not work for ISO certification. It follows national standard
15. There is no definite quality policy, vision & mission.
16. There is no system to take customer feedback.
17. There is no clear conception about quality costs.
18. About 5% is lost due to scrape & waste.
19. Only preventive method is used for handling of non-conforming products.
20. Sample of finished product is taken in testing laboratory and is tested periodically.
21. Random sampling is applied during production.
22. Inspection is performed in both during production and after production.
23. Measuring instrument has not been calibrated for five years or more.
24. Company’s own standard is followed for product support.
25. There is no specific method for inventory control.
26. Finished products are stored in normal atmospheric condition.
27. There is no warranty system
28. Working environment is average & there is a clinic for health care of the employees
29. There is no quality award system
30. The organization does not care about quality management.
31. It holds misconception about quality costs.
32. Impediments—
   • Lack of commitment of management executives on QC
• Unfair activities of trade union
• Lack of training facilities
• Faulty organization structure

Organization 9

1. In 1994, the chairman & managing Director went to Japan to take short period training
2. An in-plant training has been arrangement in Management executives
3. Several seminars on QC circle & 5-5 activities have been arranged in plant
4. A training course on "Productivity Improvement Technique" was held in the plant in association with BSTQM.
5. A private organization (with sufficient experts) is appointed to establish organization structure
6. A policy has been established on the basis of strength, weakness, opportunities & Threat (SWOT)
7. Four manuals for production management, cost management, Finance & Accounting management and workers management have been established.
8. There are eight QC circles
9. A steering committee is active to monitor the QC circles
10. 90% of finished products are being exported through ready-made garments
11. Market share is increasing due to improve the quality management
12. There is no well equipped testing lab.
13. Periodic sampling test is performed during production
14. Only preventive method is applied for reduce non-conformity.
15. Check sheet & control chart are used
16. Calibration of measuring instrument has not been performed for a long time
17. About 5-10% are wastage & scrape
18. Internal audit is performed but not in formal way.
19. There is no particular quality improvement team
20. There is no formal education & training system for workers
21. There is no particular consultant
22. The vision of the organization is to increase the productivity considering quality. The quality policy is preserved by the management.
23. There is no system to collect data for customers satisfaction/dissatisfaction.
24. There is no warranty system
25. Production process is semiautomatic
26. The nature of employee is lifetime as well as part time
27. There is a quality control manual
28. There is no procedure to involve customer in designing & marketing
29. There is no award system
30. The organization does not work for JIT.
31. The organization follows own standard.
32. There is no system to involve worker in decision making about QC.
33. Meeting about QC in management level is performed intermittently
34. The target of production volume never reaches on the benchmark.
35. There is no system for product development
36. Sales growth is increasing slightly.
37. The organization is trying to implement TQM
38. It does not work for ISO-9000 but follows national standard. It holds misconception about quality costs. There is no proper documentation system.
Impediments.
--Lower education level of maximem works is the obstacle for self-improvement
--In-efficient layout
--Lack of experts & consultant
--Lack of Government support.

Organization 10

1. There is a Research and Development section with laboratory where quality of products are tested
2. Raw materials are tested in own laboratory
3. Products are inspected during production and after production but not systematic way
4. Almost no SPC tool is used
5. Random sampling is performed for inspection
6. Calibration haphazardly has not been performed for a long time.
7. There is no internal QC auditing system.
8. There is no external auditing for QC
9. Purchasing manager ensures the raw materials
10. Raw materials are purchased through tender.
11. There is no QC circles
12. There is no quality improvement team
13. There is no formal training and education system on QC
14. Two management personnel are trained on production process
15. Management executives are not aware enough about quality control.
16. There is no clear mission or land vision.
17. There is no quality policy.
18. It does not work for ISO standard but follows notional standard.
19. There is no system to collect data about customers satisfaction/dissatisfaction.
20. There is warranty system for some cases.
21. The production process is semiautomatic.
22. Nature of employment is life time.
23. There is no quality control manual.
24. Some products are produced according to the customers’ specifications.
25. There is no award system.
26. Finished products are preserved in wirehouse.
27. The organization follows the national standard.
28. There is no system to meet all employees to exchange views.
29. Bureaucratic / Autocratic management style is present.
30. Workers follow the order of superiors. There is no system to contribute in quality planning or in any decision making.
31. Only rework system is applied for handling non-conformity.
32. Most of the wachiucris are obsolete.
33. The organization does not work for product diversification.
34. The organization does not practice TQM.
35. Impediments – to implement quality management system.
36. Lack of commitment of management executives.
37. Inappropriate practise of Trade union.
38. Disloyalty of employee towards the organization.
39. Poor level of education.
40. Lack of experts & consultant.
41. Ineffective management style.
42. Lack of proper guide line form Government.

Organization 11

1. There is a quality control department.
2. Raw materials (spare parts) are tested within organization.
3. Inspector inspect the product in both time during production and after production.
4. No SPC tools is used.
5. Periodic sampling is performed.
6 Calibration of measuring instruments has not performed for a few years.
7 Percentage of scrap/waste is very low.
8 Documents are preserved in QC department.
9 There is no internal QC auditor.
10 There is no external auditor.
11 Raw materials are purchased from reputed vendor from Japan.
12 There is no quality improvement team.
13 There is no formal education & training system for employees.
14 Management executives are quality conscious.
15 Three graduate engineers are trained up from abroad for assembly work with QC.
16 The vision of the company is to produce more products considering quality.
17 It has not got any ISO certification.
18 There is no particular system for customer satisfaction/dissatisfaction but indirectly collected.
19 There is no warranty system.
20 Service facilities are performed during warranty period in service place.
21 Production process is semiautomatic with modern machinery.
22 Only preventive method is applied to reduce non-conformity.
23 There is no definite quality policy & manual.
24 There is no quality award system.
25 Company follows the international standard.
26 Workers are not taken into decision making.
27 There is no product diversification facilities.
28 The organization does not implement TQM.
29 It does not work for ISO certification but follows national standard.
30 It holds positive attitude about quality costs.
31 Inventory control is performed on the basis of ABC model.
Organization 12

1. No seminar on quality control held in the organization.

2. Three personal have already been trained form abroad Denmark & BCSIR, Dhaka.

3. There is a quality improve team includes quality control officer and quality control supervisors.

4. There is a quality manual and it is well known by everyone of the organization.

5. There is a foreign expert as consultant.

6. The organization has a quality control department.

7. There is no formal education & training system for the employees.

8. The organization use elementary statistical methods (control chart, check sheet).

9. There is no QC circle.

10. Raw materials and packaging materials have been being purchased from enlisted vendors form Newsesland, Denmark, Germany, Thailand, England & Honkong.

11. International standard is followed during purchasing.

12. There is a internal quality control audit system which is performed by QC staff.

13. There is no external QC audit system.

14. Documentation procedure is formalized.

15. The organization has no ISO certification.

16. The organization has no plan to obtain ISO certificate but it follows national standard.

17. About 2-3% is lost due to waste.

18. Only preventive method is used for the handling of non-conformance.

19. Random sampling is performed during inspection.

20. Inspection is performed during production.

21. The calibration of measuring instrument is performed once a year.

22. Production is controlled on the basis of documentation.
23. Semiautomatic production process is being performing with modern machinery.

24. Only preventive method is applied for handling non-conformity.

25. International standard is followed for product support.

26. There is no particular method for inventory control.

27. Finished products are preserved in a controlled environment (in suitable temp. & humidity)

28. Products are exchanged on the basis of customers complaints.

29. There is no quality award system.

30. Working environment is good but there is no clinic for the health care of employee in factory premises.

31. The organisation has a plan to implement TQM in near future.

Organization

1. No seminar on QC is arranged yet.

2. No person has been sent abroad for training.

3. No personnel is trained from reputed service organisation in the country.

4. There is no quality improvement team.

5. There is no quality manual.

6. There is no consultant.

7. The organisation has a Quality control department.

8. There is no formal education & training system for employee on QC.

9. The organization use some elementary SPC tool.

10. There are five quality control circles.

11. There is no QC auditing system.

12. Documents are preserved haphazardly.

13. The organization is not aware about ISO standard, but it follows BSTI standard.

14. There is no clear cut quality policy, vision & mission.

15. There is no customer feedback system.
The organization holds positive conception about quality cost but there is no methodology for assessment.

About 5% is lost due to scrape & waste.

Only preventive method is used for the handling of non-conformance.

There is no testing facility.

Periodic & random sampling are performed during production.

Inspection is performed during after production.

Production method and sequence are clearly defined but there is no system to identify the batches.

Semiautomatic with modern machinery is present for production process.

Company standard is applied for product support.

ABC model is applied for inventory control.

Finished product is stored in controlled area.

Products are delivered to the market with own vehicle imposing special care.

Bad products are replaced by good once.

There is a incentive bonus for expert employee.

Any decision comes from top management.

Impediments:

- Lack of knowledge of top management on quality control
- Lack of quality expert
- Lack of training facilities
- Misunderstanding about quality improvement
- Excessive cost incurred for raw materials.
References


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Bibliography


