“A Case Study of Quality Assurance in a garment industry”

Submitted To:
Textile Committee

Advisor/Supervisor:
Dr. Nabeel Amin

Submitted By:
Asia Rasul – 040420079

Department of Textile Engineering
University of Management and Technology
Lahore

Acknowledgements:

I am thankful to all **Textile Department of UMT** especially **Dr. Nabeel Amin** (HOD. of Textile Engineering, UMT) from the bottom of my heart for his direction & guidance throughout my project. He not only provided the necessary material & thoughts, but also encouraged me to do new things that promote a very creative environment for research. Moreover, he allowed me to expand my knowledge in many areas of Garments especially in the field of Quality. I am also thankful to all industries that helped me to complete my project.

Signed:
Asia Rasul
040420079

Dated:
July 10, 2009

Table of Contents

Chapter # 1

Introduction: -

1.1-About Project:

The project is about the quality assurance and control department in a garment mill. The word quality represents all aspects of a garment. As “A. J. Chuter” said in his book “Introduction to clothing production management”, Quality of a garment is the reason why it is bought. This definition tells what quality is, according the customer point of view. The customer is the end user but there are many other places from where a garment has to assure its quality. The quality assurance department as shown by its name assures the right value of quality which is own by the garment. Before going forward lets just check some definitions about Quality, Quality Assurance, and Quality Control of different authors.

1.2-Quality: -

There are different definitions about Quality. Some of them are given below…

1. The Quality of a garment is the reason that why it is bought by the customer. (Chuter, 1988, p.112)
2. Quality is ultimately a question of customer satisfaction. (Mario Bona, 1990)
3. The ensemble of properties and characteristics of a product or a service, which confer on it the capacity to satisfy expressed or implicit requirements.
4. Quality is the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs.
5. Quality is a complex concept used to describe the degree to which a process, material, product, or service possesses desirable physical or intangible attributes. (Sara J kadolph, p.560)

Quality is a necessary, but elusive, element that applies to all aspects of conducting business in today’s market. For individuals interested in learning about and pursuing careers in the textile industry complex, quality includes understanding the way in which product development and production are integrated, so that products satisfy consumer exceptions. Everyone talks about quality, but successfully planning for and manufacturing quality in products requires access to knowledge, as well as the development and co-ordination of wide-ranging and multifaceted skills in all areas of the textile industry complex. The development of a quality assurance program is therefore a driving force in many industries, especially because producing quality products at a competitive price is a major factor in world markets.

The approach to achieving quality in a product or service is not uniform. The factors of importance vary among industries. For example, training, equipment, and materials are quite different between the steel industry and the food processing industry. Nevertheless, some basic concepts related to internal operations, identifying customers' needs, and meeting business goals are same to all industries. The manner in which a company's management views quality will influence almost every activity it undertakes. Some companies and industries are more advanced in their approach to quality; other take a more traditional approach. The textile industry complex tends to be more traditional.

The concept of quality has become very important within the textile and apparel industry. Employees refer to quality when they talk about the operating structure of their company, work with suppliers or vendors, sell to customers, and promote their products.

Consumers are increasingly demanding in what they took for in textile products and discriminating in what they find acceptable. Quality is one important factor that consumer use in making decisions regarding textile product purchases. Consumers are more likely to purchase a product that they perceive to have good quality than a product that they find lacking in quality. Thus, to satisfy the consumer and remain competitive, a company must consider quality when the product is developed, produced, and marketed.

The global marketplace has increased competition throughout the textile industry. This increased competition affects material producers, manufacturers of sewn products, retailers, and consumers. The products now on the market are from many countries and vary significantly in product cost, characteristics, and attributes. To survive in this highly competitive climate, companies need to maintain quality. Companies that consistently produce substandard products or products that do not meet their target market's exceptions do not survive.

As a result of the growing global market, a wide variety of products are available from many sources. These products represent a range of fibers, fabric structures, styles and fashions, construction methods, appearance standards, and performance levels. Because these variables combine to create products at many quality levels, it is challenging for consumers to differentiate among products to determine which will be satisfactory. Thus consumers have become more dependent on experts who work with and assess the quality of textile products. These experts are expected to assure consumers that products in the marketplace are of satisfactory quality. Unfortunately, quality is a nebulous characteristic that is not easy to define.

Interest in quality has become pervasive within the business world. Companies must recognize the importance of incorporating quality in standard day-to-day business practices t to do business with other companies and customers.

Companies demand quality in materials received from suppliers and service providers. It is becoming standard practice for issues related to quality to be incorporated into contracts. For example, vendor contracts often refer to manuals that offer detailed descriptions of expectorations concerning product characteristics related to many factors, including seam types, color matching of materials, and inspection methods.

Textile, apparel, and furnishing companies are competing in a market that has changed considerably in the past few decades. Improving product quality is one way a company can improve its ability to survive. Companies use quality assessments to promote their products. Unfortunately, the industry and the customer do not always agree on the characteristics of quality and the ways in which quality should be measured or judged. This mismatch leads to customer complaints, distrust, and incorrect perception of standard business practices.

Quality is a complex concept. No single definition addresses all the dimensions, areas of impact, and concerns related to quality. The term itself is used in many ways for many reasons. Each use reflect a different perspective based on philosophy, economics, consumer behavior production and engineering, and value systems. Definition may focus on a holistic perspective, the impact of quality on organization's income, the changing market place, the nature of a product or service, the way a product or service conforms to specifications, or the ability of a product or service to meet customers' needs and satisfy their demands. Companies and their employees need to understand how quality affects organizations, standard practices within organizations, consumer behavior, customer purchases and satisfaction, and competition within the marketplace.

1.2.1-Definitions of Quality

1.2.1.1-Holistic Perspective

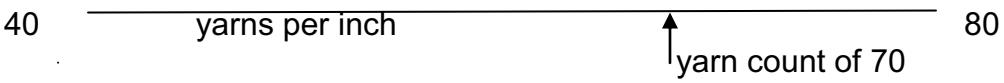
Webster's dictionary (1977) defines quality as " that which belongs to something and makes or helps to make it what it is; characteristic element; any character or characteristic which may make an object good or bad; the degree of excellence which a thing possesses." This is a good beginning point, because the it helps us look at quality from a holistic perspective and implies that even if quality is not the same for all things; it is still inherent in all objects and actions.

Thus, quality is defined as the total of characteristics that help describe the overall object or service. The assumption is that "you will recognize quality when

you see it." This native approach is still widely held by many experts and consumers, but it does nit addresses many important contemporary business issues, such as understanding the components that contribute to quality, engineering quality into a product, measuring a product's quality, and improving quality of product or process. **C**otton provides a good illustration of these issues. Many individuals assume that cotton is the best fiber on the market, even though its production and processing have inherent environmental drawbacks and cotton does not perform as well as synthetic fibers for many end uses. In addition, many types and quality levels of cotton exist. Some have less environmental impact than others. Some are stronger and have greater fiber length than others. However, cotton is not always a good choice for many textile products. Imagine, for example, how different undergarments and support garments would be if they were manufactured without the synthetic fiber spandex.

1.2.1.2-Product Perspective

Product quality is represented by the total of a set of precise and measurable characteristics or components of a finished product. Differences in product quality can be attributed to differences in components or characteristics. A continuum can be developed on which the quality of any one characteristic can be precisely located. Consider, for example, two measures used to characterize the quality of woven fabrics: weight in ounces per square yard (oz/yd^2) and yarns per square inch for wrap and filling. One assumption is that the greater the weight within a given range or the higher the count of yarns, the better fabric. Figure below illustrates one continuum for a fabric. The characteristics of weight and count are linked to yarn and weaving cost, but does not necessarily imply better products. For example, greater weight may mean that the fabric does not drape as well as lighter fabric. Therefore, in products where drape is a critical factor, lower weight may be preferred. Similarly, finer yarns may be less abrasion resistant than coarser yarns. Thus, for products where high abrasion resistance is required, coarser yarns may be preferred. Clearly, these common measures of quality are not necessarily directly related to consumer satisfaction.



1.2.1.3-Producer Perspective

From a producer's or manufacturer's perspective, quality is often defined as consistent conformance to specifications and standards. Thus, when a product meets a company's standards and specifications, it has achieved the desired quality level. This desired level may be high, low, or at any point in between the extremes of the continuum. By this definition, quality is achieved products consistently fall within a range of acceptable measures for all dimensions of quality. An example of quality in terms of consistent conformance includes

buttons that are within a narrow range of the specifications for diameter, thickness, and color, and have the appropriate number and size of holes for sewing to a shirt. These characteristics are especially important in factors in which buttons are attached to product components by automatic button setting machines. These buttons may or may not perform in a satisfactory fashion for the consumer, but they satisfy the manufacturer's expectations for quality and performance. This producer-oriented definition of quality suggests that manufacturers will not stay in business if too many products fail to meet standards and specifications, but it does not address consumer expectations.

This producer's definition of quality addresses a company's ability to produce products that consistently meet predetermined criteria and can be sold in the market at full price. The emphasis here is on consistently meeting stated expectations. A hidden assumption is that products that meet this level of quality will produce the greatest income and profit for the company. Thus, a company with this perspective ideally should meet its business objective.

Philip Crosby, a well known quality expert, states that quality is free. He means that production costs are the same for items that do and those that do not meet specifications and standards. Hence, Crosby says that production and material costs are the same for **first-quality products** (those that meet the standards) as for **substandard products** (those that do not meet the standards). Crosby's 14c steps to quality improvement are listed below….

1. Make it clear that management has a long-term commitment to quality.
2. Form cross-department quality teams.
3. Identify where current and potential problems exist.
4. Asses the cost of quality and explain how it is used as a management tool.
5. Increase the quality awareness and personal commitment of all employees.
6. Take immediate action to correct problems identified.
7. Establish a zero defect program.
8. Train supervisors to carry out their responsibilities in the quality program.
9. Hold a zero defect day to ensure all employees are aware there is a new direction.
10. Encourage individuals and teams to establish both personal and team improvement goals.
11. Encourage employees to tell management about obstacles they face in trying to meet quality goals.
12. Recognize employees who participate.
13. Implement quality councils to promote continual communication.
14. Repeat everything to illustrate that quality improvement is a never-ending process.

(Crosby's, 1979)The cost to company are constant regardless of how much first-quality salable merchandise has been produced In other words, the cost to produce 100 items is the same regardless of whether 100, 75, or 50 items are first quality. Companies have the same investment in a substandard product as in a first-quality product. However, the return from the substandard product will be substantially different from that of the first-quality product. Companies lose money on substandard product, even when those products are reworked so that they meet first-quality standards. Thus, efforts to improve quality emphasize reducing substandard products or defects. Sometimes this approach is referred to as zero defects management, because the goal is to have zero defects in production.

From a customer's perspective, quality depends on the dimensions of a product or service that are of importance to that user. These dimensions will differ by product or service type, as well as by customer. Returning to the button example may help clarify this point. The customer could be the manufacturing company who buys buttons to attach to shirts, or it could be the individual consumer who wears and cares for the shirts to which the buttons have been attached. Thus, both customers should be considered when button quality is defined and assessed.

This perspective recognizes the primary role of the customer in determining whether or not a product or service meets or exceeds expectations. However, quality is not in a steady state; from a customer's perspective, quality reflects an ever-changing market place and satisfies the ever-changing needs of the customer in that market. Thus, the buttons should not be adversely affected by any chemical or abradant finishing the shirt receives. In addition, companies need to respond to changes in expectations and needs by maintaining contact with their customers.

One difficult aspect of examining quality from the customer's perspective is understanding and incorporating the characteristics that the customer finds desirable at a price that is acceptable. For example, the price-conscious consumer might find superior colorfastness to washing and abrasion desirable, but may not be willing to pay a higher price for a product that exhibits these characteristics. From the manufacturing perspective, customer desire consistency of fabric width and color, ease of spreading, and freedom from visible fabric defects. But with the exception of consistency of color and freedom from visible defects, consumers are generally not concerned with the other fabric characteristics that are very important to manufacturers. Hence, a company needs a good understanding of the want of the immediate customer and the ultimate customer.

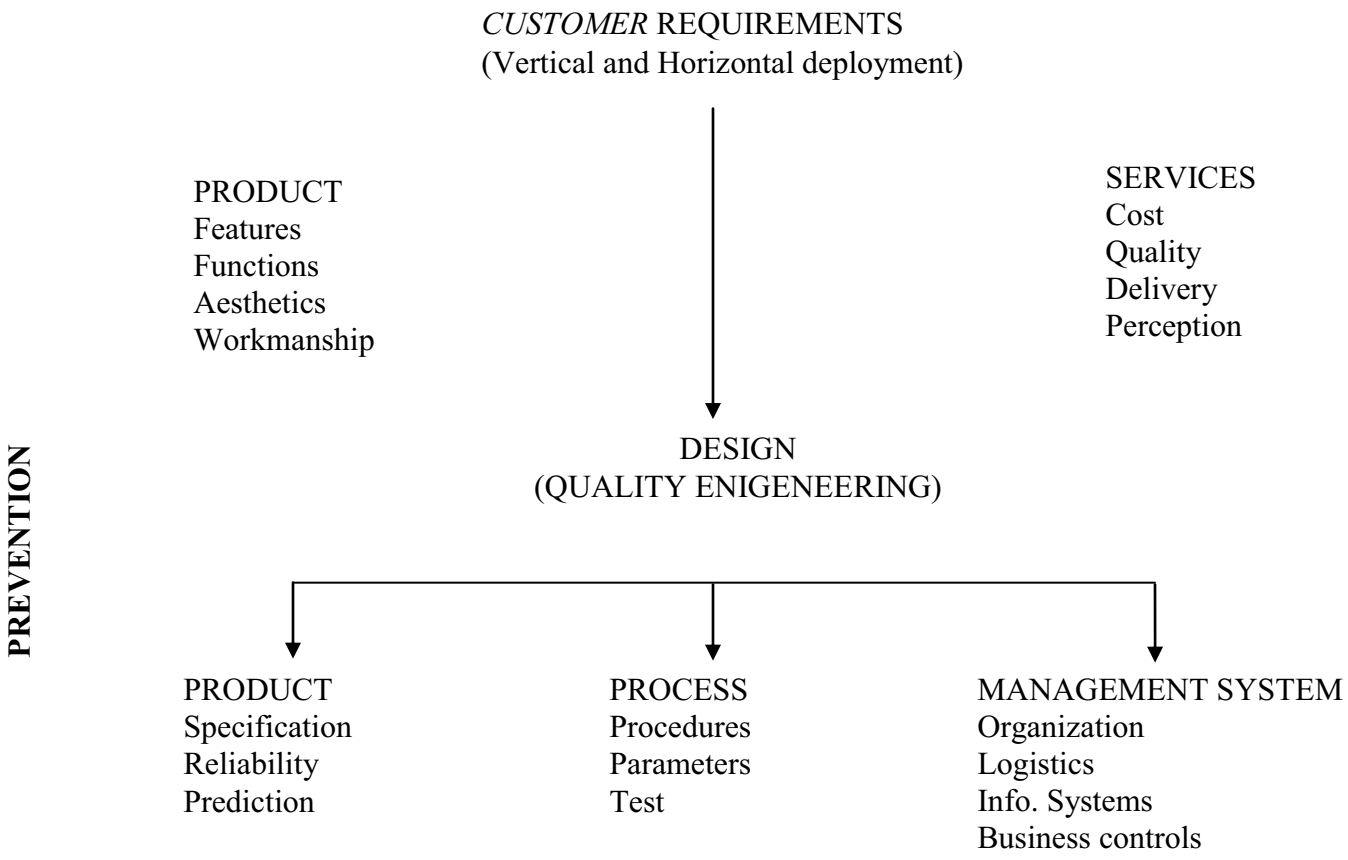
The focus on customers and their satisfaction is a basic underlying principle of **total quality management** (TQM). Several definition of TQM exists. All focus on an integrated, continuous improvement process that involves everyone in the organization. In TQM, all of the company's actions are directed toward producing a quality production for the target market, satisfying the target market, and meeting the company's business objectives. Although business objectives generally focus on financial and market growth, these objectives must include customer satisfaction. Satisfying business objectives forms the foundation for customer satisfaction. As shown in figure below. Customer satisfaction will not occur if the company keeps in contact only with customers only through complaint departments, satisfaction surveys, and warranties.

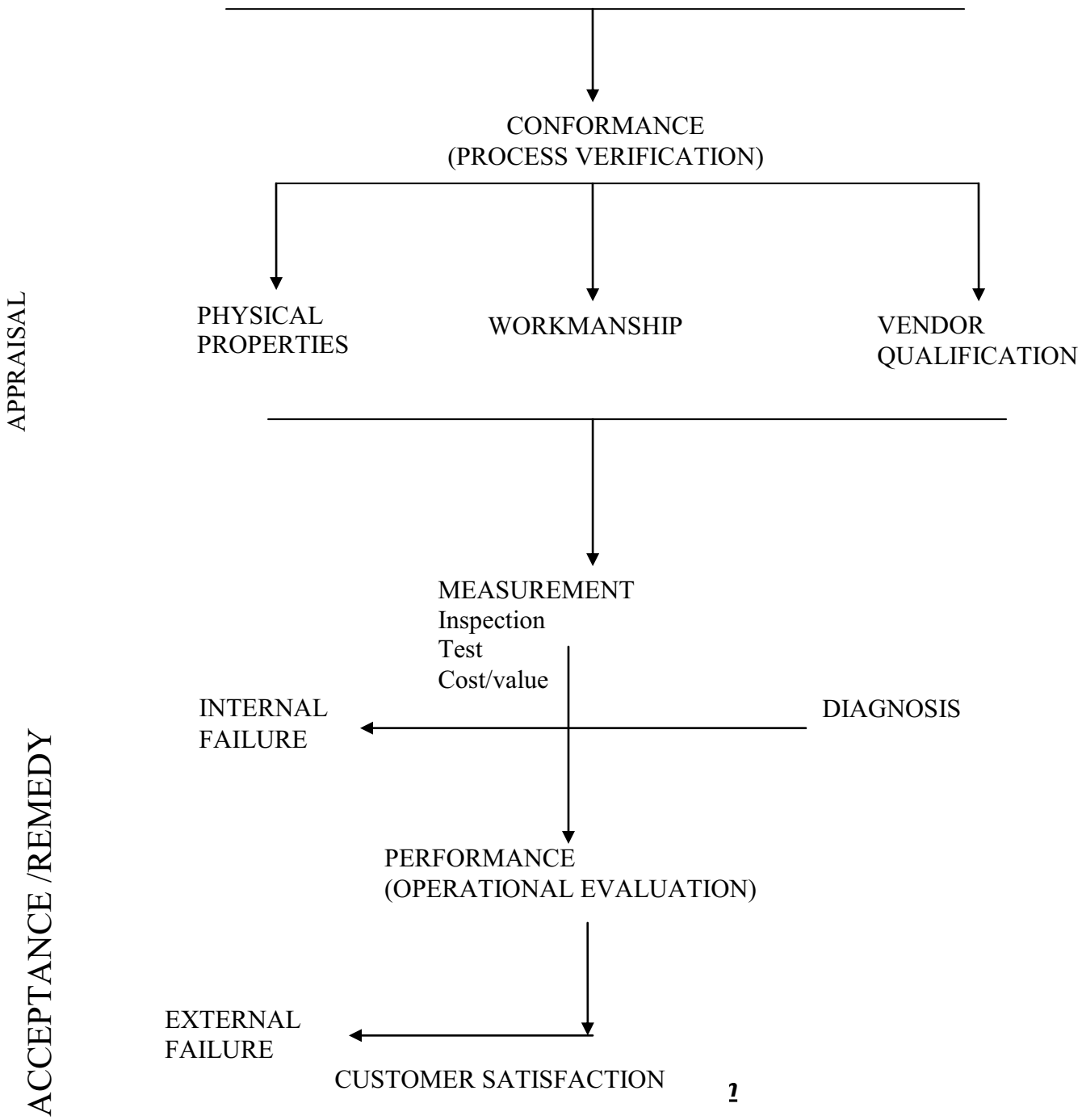
1.2.1.4-Customer Perspective

Each functional area of the company should focus on satisfying the customer. A management system that involves all parts of the company in improving customer satisfaction is therefore necessary. Many companies assume that they

understand their customers, but they really have a distorted perspective. Companies must understand all interactions customers have perspective. Companies must understand all interactions customers have with the company and use that information to improve the system. For example, if a customer complaint is handled only by the complaint department and no further effort is taken to prevent the problem from recurring, the problem remains and overall customer satisfaction does not improve. Many companies within the textile industry have adopted a TQM approach to minimize problems with customer satisfaction. Figure shown below illustrates a system wide approach used within a dyeing operation. Many companies within the industry use similar systems.

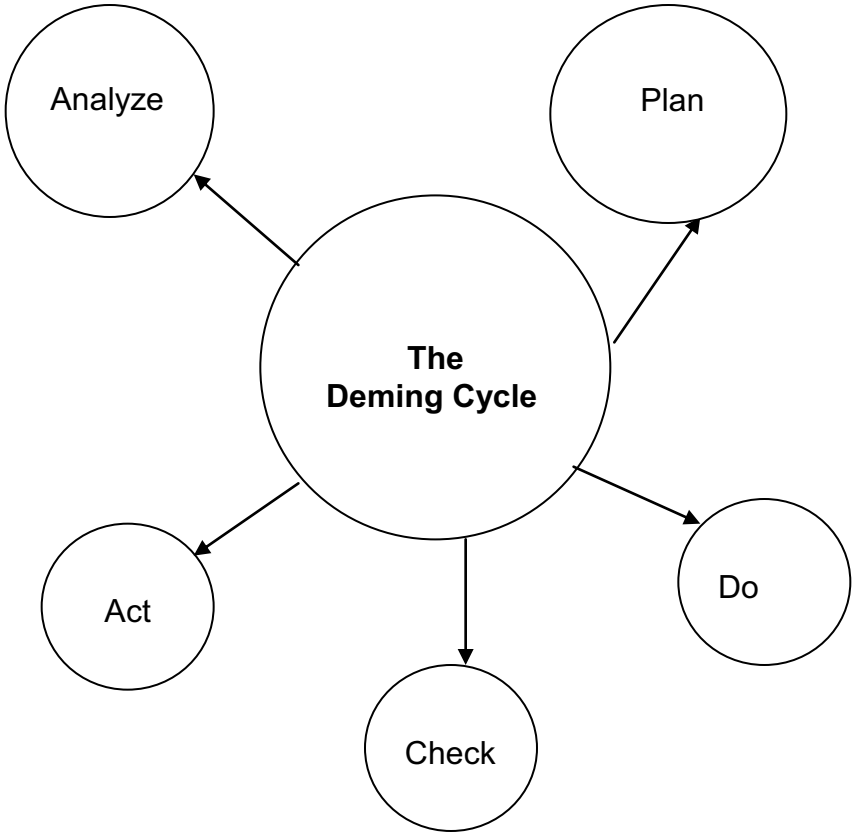
One of the first individuals to recognize the need to focus on quality in production and product development was W. Edwards Deming (1982), who maintained that quality is the responsibility of management. Deming's management principles include 14 points that relate to adopting a philosophy of improving products and services, remaining competitive, staying in business, and providing jobs. One principle involved building quality into products from inception of the Idea. Deming focused on minimizing total cost and constantly improving the system. Continuous training on the job and innovative leadership are crucial. Cross-functional teams, so common in today's textile industry complex, facilitate communication across departments and help companies reach their quality goals. Deming's 14 points continue to have a significant impact on the quality movement within the U.S. industry.




CONFORMANCE
(PROCESS VERIFICATION)
PHYSICAL
PROPERTIES
WORKMANSHIP
VENDOR
QUALIFICATION
APPRAISAL
MEASUREMENT
Inspection
Test
Cost/value
INTERNAL
FAILURE
DIAGNOSIS
PERFORMANCE
(OPERATIONAL EVALUATION)
EXTERNAL
FAILURE
CUSTOMER SATISFACTION
?
ACCEPTANCE /REMEDY

1.2.1.4.1-DEMING'S 14 POINTS

1. Create constancy of purpose for improvement of product and service.
2. Adopt the new philosophy.
3. Cease dependence on mass inspection.
4. End the practice of awarding business on the basis of price tag alone.
5. Improve constantly and forever the system of production and service.
6. Institute training.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the work force.
11. Eliminate numerical quotas for the work force.
12. Remove barriers that rob people of pride of workmanship.
13. Encourage education and self-improvement for everyone.
14. Take action to accomplish the transformation.



The Deming Cycle

The Deming cycle, which links production, target markets, and business objectives, can be summarized as a five-step approach (Goetsch & Davis, 1944):

1. Conduct consumer research. Use the results in planning the product (plan).
2. Produce the product (do).
3. Check the product to make sure it meets criteria identified in the plan (check).
4. Market the product (act).
5. Analyze how the product is received in the marketplace in terms of quality, cost, and other criteria (analyze).

Many companies follow these steps as they develop, produce, market, and evaluate or analyze their products. The need for communication within the company and with customers is vital for survival in today's market.

Joseph M. Juran is another quality pioneer, who developed ten steps to quality improvement. Juran's (1989) approach, another example of zero defect management, concentrates on eliminating the relatively few sources that cause the majority of problems. Once, again, the focus is on understanding customers, communication within the company and with customers, and continuous improvement.

1.2.1.4.2-JURAN'S TEN STEPS TO QUALITY IMPROVEMENT

1. Build awareness of both the need for improvement and opportunities for improvement.
2. Set goals for improvement.
3. Organize to meet the goals that have been set.

4. Provide training.
5. Implement projects aimed at solving problems.
6. Report progress.
7. Give recognition.
8. Communicate results.
9. Keep score.
10. Maintain momentum by building improvement into the company's regular system.

1.2.1.5-Value-Based Perspective

From a value-based approach, quality products are those that perform at acceptable prices or conform at acceptable costs (Winchester, 1944). Thus, value and excellence are combined in a concept that is referred to as affordable excellence (Garvin, 1984). Here, value is expanded to incorporate service, delivery, and financial arrangements. But, this concept is more difficult to assess than several of this discussed previously. Silverman and Propst (1996) expand the scope and define value as the customer's perception of total lifetime benefits minus total lifetime costs. Thus, when benefits exceed costs, the customer is satisfied and the quality level is perceived as good. When costs exceed benefits, the customer is not satisfied and quality is perceived as poor.

1.2.1.6-DIMENSIONS OF QUALITY

From a value based approach, quality products are those that perform at acceptable prices or conform at acceptable costs (Winchester, 1994). Thus, value and excellence are combined in a concept that is referred to as affordable excellence (Garvin, 1984). Here, value is expanded to incorporate service, delivery, and financial arrangements. But, this concept is more difficult to access than several of those discussed previously. Silverman and Propst (1996) expand the scope and define value as the customer's perception of total lifetime benefits minus total lifetime costs. Thus, when benefits exceed costs, the customer is satisfied and the quality level is perceived as good. When costs exceed benefits, the customer is not satisfied and quality is perceived as poor.

1.2.1.6.1-Summary

Quality is a dynamic state associated with products, services, people, processes, and environments that meets or exceeds expectations (Goetsch & Davis, 1994). For TQM, the customer's perspective (including the need for consistency in

products and expectation that products meet standards and specifications) defines quality for the company. Companies are organized to address the customer's expectations for quality, and their business plans reflect that focus on customer satisfaction.

1.2.2-Quality Assurance & Quality Control

The term Quality has two aspects in textile industry. One is **Quality Control**, and the other is **Quality Assurance**. Both departments are directly related to each other. The work of Quality Control department is to Control the Quality of production. And the Quality Assurance department is to ensure that the product is meeting the needs of Quality.

Some definitions of Quality Assurance and Quality Control are given below.

1.2.2.1-Quality Assurance

- Quality assurance is the dynamic approach it is the main step to success,
- (Mario Bona) Quality Assurance is the process of verifying or determining whether products or services meet or exceed customer expectations.
- (A.J.Chuter)Quality Assurance is a process-driven approach with specific steps to help define and attain goals.
- **Quality Assurance** is a process that includes planned and systematic steps from the production of the product to its completion to ensure the suitability of the product for its intended purpose.
- (Dr. W. Edwards Deming) The process of Quality Assurance shows confidence in the product that it will fulfil the customer needs and requirements in methodical and reliable fashion.
- In developing products and services, Quality Assurance is any systematic process of checking to see whether a product or service being developed is meeting specified requirements. Many companies have a separate department devoted to Quality Assurance.

1.2.2.2-Quality Control

- (Mario Bona) The main function of Quality Control department is not to Control Quality but to provide service, which allows other people to make good clothes.

- (A.J. Chuter)Quality is actually controlled by the process of manufacture, from design to pack and dispatch.
- The term is conventionally used to describe the process which management seeks to monitor the Quality of output, to compare it with the accepted standards and to act upon the difference.

(Mario Bona) There are two types of Quality Control.

Statistical Quality Control.

Total Quality Control.

1.2.2.3-Statistical Quality Control

It is a term, which implies that only a proportion of the garments re examined and that these are chosen according to rules, which come from the theory of statistics. It has been oversold in the past, in terms of its accuracy, and the assumption on which it is based may often not apply to garment manufacture

1.2.2.4-Total Quality Control

It is a name given by the movement, which arose as a reaction to the over-enthusiasm of the '**SQC**' pundits. It suggests a return to the idea that good Quality is part of the whole manufacturing process. 'Zero Defects' and 'Right First Time' have a similar connotation. (Mario Bona)1.2.3-Textile Quality Assurance

Textile quality assurance is the process of designing, producing, evaluating, and checking products to determine if they meet the desired quality level for a company's target market. It involves many activities that are based on knowledge of textiles, design, merchandizing, production, consumer behaviour, product and process evaluation, marketing and statistics. Although individual employees in many firms have titles that incorporate the word quality, no one person is completely and solely responsible for the quality of finished products.

One common misunderstanding is that quality can be assessed after production of the textile product. While this may be so, the implication of this approach can be expensive, particularly when resources, such as labour and materials, are invested in producing a product that turns out to be unacceptable. For example, companies can miss shipping deadlines due to products that did not pass inspection. In addition, this post production quality control approach increases the possibility that an unacceptable product will reach a consumer. This approach is often referred to as **quality control**. In this process, quality is

controlled after production by inspecting the goods and sorting them into acceptable and unacceptable groupings. Because unacceptable products may be passed over or missed during inspection, it is more likely that a consumer will purchase an item that is not satisfactory.

Companies that approach quality from a different perspective tend to do a better job of manufacturing products to a desired level of quality on a consistent basis. According to these companies, quality is inherent in a product and is incorporated into the product during product development, production, and marketing. Many departments within a single company interact to help ensure that the final product is of the appropriate quality for the market. When quality is considered from this perspective, it is vitally important that the departments or individuals involved understand their roles in terms of quality and work to meet expectations for product quality. In addition, these companies ensure that their suppliers use appropriate quality materials to create the product. Thus, textile quality assurance considers not only the quality of finished product, but also the actions and interactions of the departments, materials, and processes involved in production.