53380

TOTAL QUALITY MANAGEMENT SYSTEM PROPOSAL FOR A FOOD PLANT

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
THE MIDDLE EAST TECHNICAL UNIVERSITY

BY

HAMİ ALPAS

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF
MASTER OF BUSINESS ADMINISTRATION
IN
THE DEPARTMENT OF MANAGEMENT

T.C. YÜKSEKÖĞRETİM KURULU
DOKÜMANTASYON MERKEZİ

SEPTEMBER 1996

Approval of the Graduate School of Social Sciences

Prof. Dr. Bahattin Akşit
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Business Administration.

Prof. Dr. Aleaddin Tileylioğlu
Chairman of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Business Administration.

Doç. Dr. Ömer Yağız
Supervisor

Examining Committee Members

Prof. Dr. Mustafa Özilgen

Doç. Dr. Ömer Yağız

Instructor Dr. Semiha Feriha Aşçıgil

ABSTRACT

TOTAL QUALITY MANAGEMENT SYSTEM PROPOSAL FOR A FOOD PLANT

Alpas, Hami
MBA., Department of Management
Supervisor: Assoc. Prof. Dr. Ömer Yağız

September 1996, 95 pages

In this study, A Total Quality Management (TQM) system is designed and its underlying principles are suggested to a food plant, Nuh Pasta Products Company. Within this scope, the structure of the management system, the technical system and their interactions for the company are examined in terms of quality. The need for a TQM system for the company is outlined and the necessary actions to be taken for the successful installation of the proposed TQM system are shown. The implementation of the designed TQM system is left to the company top management. Finally, the expected results and the prospects of the proposed TQM system are discussed.

Keywords: Total Quality Management (TQM), pasta products.

ÖZ

BİR GIDA FABRİKASI İÇİN TOPLAM KALİTE YÖNETİMİ SİSTEMİ ÖNERİSİ

Alpas, Hami
Yüksek Lisans Tezi, İşletme Anabilim Dalı
Tez Yöneticisi: Doç.Dr. Ömer Yağız

Eylül 1996, 95 sayfa

Bu çalışmada, Nuh Makarnacılık A.Ş. isimli bir gıda fabrikası için, Toplam Kalite Yönetimi (TKY) sistemi tasarlanmış ve temel prensipleri önerilmiştir. Bu kapsamda, yönetim ve teknik sistemin yapısı ve birbirleriyle etkileşimleri, kalite bağlamında incelenmiştir. Şirketin, Toplam Kalite Yönetimi sistemine olan gereksinimi belirlenmiş ve tasarlanan Toplam Kalite Yönetimi sisteminin başarılı bir biçimde şirkete yerleştirilebilmesi için gerekli faaliyetler gösterilmiştir. Tasarlanan sistemin uygulaması şirket üst yönetimine bırakılmıştır. Çalışmanın sonunda, tasarlanan Toplam Kalite Yönetimi sisteminden beklenen sonuçlar tartışılmıştır.

Anahtar Kelimeler: Toplam Kalite Yönetimi (TKY), Makarna Ürünleri

ACKNOWLEDGMENTS

I would like to acknowledge Dr. Ömer Yağız, for his valuable guidance, continued advice and support throughout the study.

Thanks go to all my friends and lecturers of the Department of Food Engineering.

I would like to thank my family for their support, encouragement and patience.

Finally, I would like to express my deepest gratitude for Elçim Gürsel who shared the workload and have provided the motivation without which it would have been impossible to finish this thesis.

TABLE OF CONTENTS

LIST OF FIGURES

FIGURES

LIST OF TABLES

TABLE

CHAPTER I

INTRODUCTION

1.1 About The Company

Nuh Ticaret ve Sanayi A.Ş. is one of Turkey's leading semolina and macaroni producing plants, situated on a land of 11.000 m^2 in Ankara.

Nuh Gıda, a subsidiary Company of Nuh Ticaret ve Sanayi A.Ş., Produces macaroni with the Italian technology in its plant since 1950.

The capacity of the factory is 200 tons per day of macaroni that will be increased to 400 tons per day.

There are 110 white collar and 250 blue collar workers. A total of 11 engineers is working in the company. The administrative department is composed of 40 people and there are 7 technicians in the quality control department. The organization chart of the company is given in figure 1.

The company has 20 % of local market share, ranking the first in general in Turkey, however, it is in the third or fourth place in the market share especially in the western region of Turkey due to fierce competition from the rivals. On the average 1000 tons per month of macaroni products are exported to different countries all over the world. The company product tree is given in Appendix 1, which should be enlarged with different types of products such as macaroni with vitamins, eggs, spinach and tomatoes.

Nuh Gıda, although a subsidiary company, is managed as a family business. Thus, it mainly lacks the systems for maintaining the flow of work and systems for quality.

Throughout this thesis, a quality system for the design and installation of a Total Quality Management program will be developed and suggested to the company. It is up to the company management to implement this program or to continue the current situation that is summarized below.

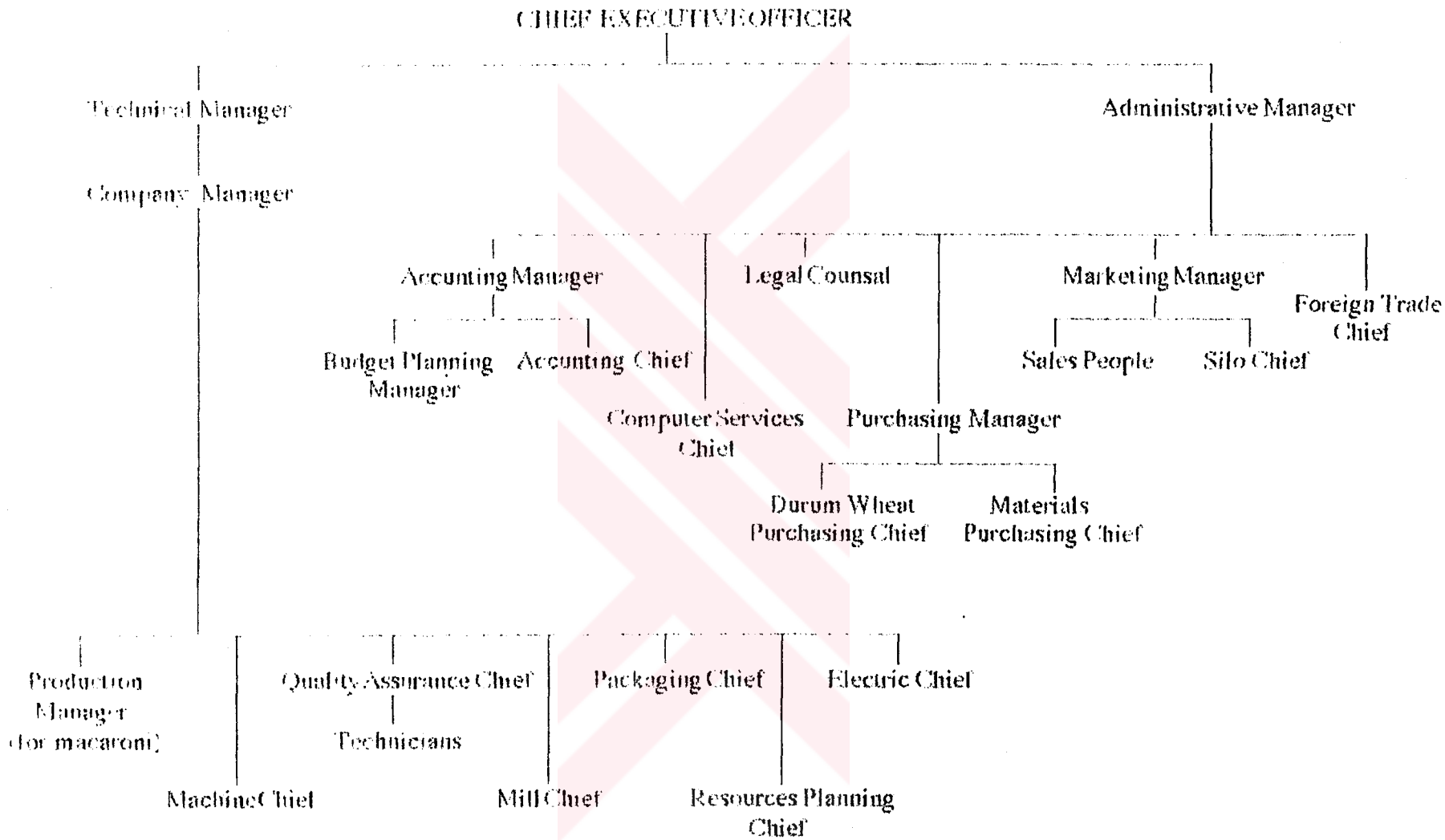


Figure 1. Organization Chart of the Company

In the company, quality is the responsibility of the quality control personnel only. Quality is controlled subjectively with insufficient use of statistical techniques and process of detection, and as a result bad products are segregated from the good ones after the processing. Vendors are unpredictable as to quality, delivery and price and purchasing personnel experience a shoddy performance instead of encouraging quality. As a result, the company produces whatever is delivered with no specifications on incoming materials and then calculates the product and finally finds a disposition for the quality. The workers in the company are divided into two as white collar and blue collar. The employees are criticized for quality but they are not adequately trained for it and have no say in the decision making process. As a result, they work according to the clock regardless of process efficiency or product quality and do what they can do under these circumstances. Marketing and sales personnel are not alert to customer's needs and expectations. The reputation of the company name is primarily used by the marketing personnel. Company receives complaints but an active program to investigate, initiate corrective action and respond to these complaints is not present.

Management in the company is not seen. Quality is unpredictable and price of quality is non-conformance. Finally, an up-dated policy statement is not present and the values and objectives of the company are not promoted to all employees and the public at large.

1.2 What is Quality?

Quality is defined as ' that which makes something that is; characteristic element; basic nature, kind; the degree of excellence of a thing; excellence, superiority'. This is not a practical definition, since it does not fully describe the many uses and understandings of quality in business and industry. As perspectives change at different parts in an organization, the need for different definitions of quality is obvious. However, the most applicable definitions are fitness for use and conformance to specifications, as both are necessary for customer satisfaction.

In a broad sense, quality assurance refers to any action directed toward putting consumers with products (goods and services) of appropriate quality. Quality assurance has been an important aspect of production operations throughout history (Provost and Norman, 1990). On examining the historical developments in quality, four significant influences that affect attitudes on quality can be pointed; consumer awareness, improvements in technology - especially in electronics, inadequate managerial philosophies and practices, and the economic impact on national competitiveness.

1.3 The Total Quality System

The Total Quality System can be viewed as composed of two related system - the management system and the technical system as shown in Figure 2. The management system is concerned with planning, organizing, controlling, and human resources management processes relating the quality assurance programs. Growing out of human resources management are structures for employee involvement and team approaches to decision making, quality improvement, and problem solving.

The important terms in this global view of quality are system, process, structure, and technique. To have this system working; management must be aware of customer needs, the capability of the company's production processes, and the financial implications of any decision and quality should be the responsibility of everyone in the organization from the operators on the production floor to the chief executive officer (CEO). The structure of the management system, the technical system, their interactions and the presence or absence of the blocks in Figure 2 in Nuh Pasta Products Company will be examined in this study.

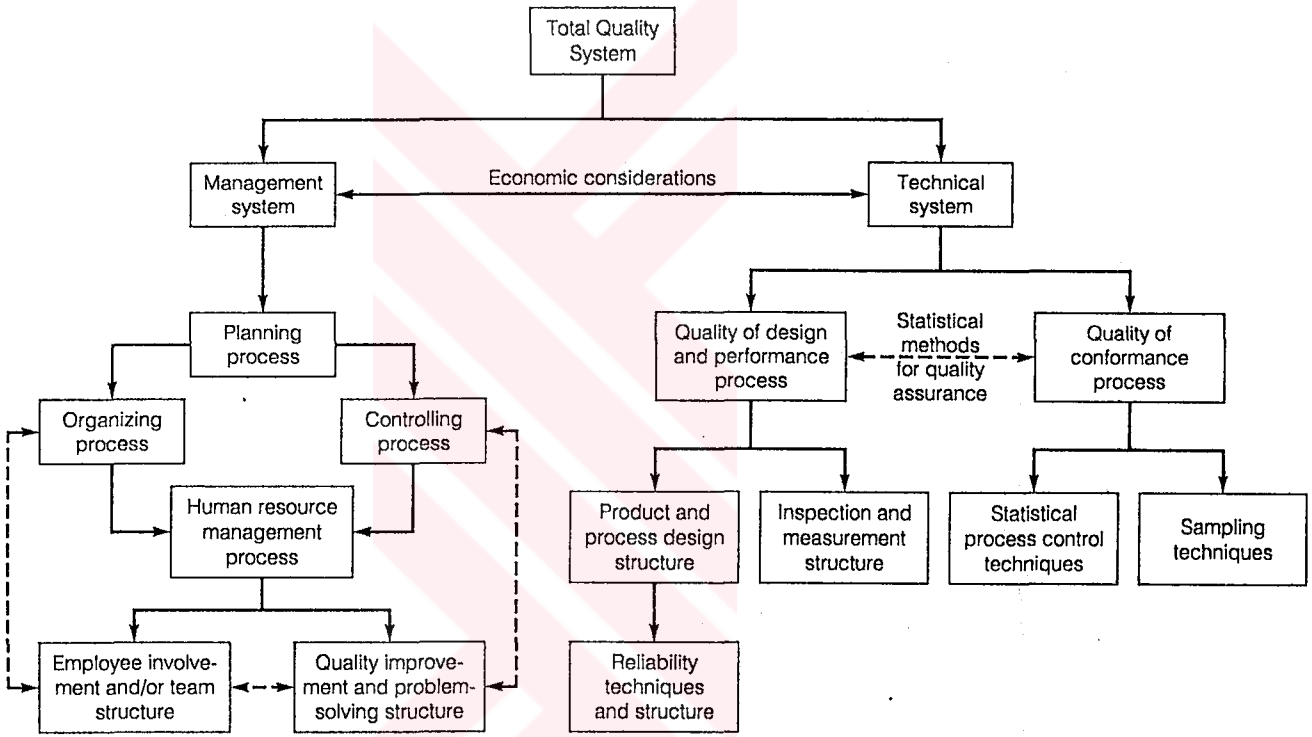


Figure 2. The Total Quality System Model

CHAPTER II

LITERATURE SURVEY

2.1 Quality Leaders

The development of Total Quality as a management system began in the United States at the turn of this century. Several individuals played key roles in development, implementation, and dissemination of this important new approach to managing an organization. While they may have previously labored with little recognition for their contributions, since 1980 their involvement in Total Quality Management (TQM) has become appreciated throughout the world.

2.1.1 Frederick W. Taylor

is credited being one of the first to attempt to use new approaches to improve the work of unskilled workers in an organization. Taylor, a chief engineer, developed a series of concepts that laid a foundation for work improvement during this century. The systematic approach of analysis and the application of some basic concepts to manual work earned Taylor the title of 'father of scientific management' (Hoy and Cecil, 1978).

In his book, The principles of Scientific Management, Taylor reveals the daily task, standard conditions, high pay for success and high loss for failure as the basic elements of his management theory. He was able to demonstrate for the first time that the economic pie could be increased not only by the application of capital and labor but by the application of knowledge to work.

2.1.2 Walter A. Shewhart

was a statistician employed by Bell Labs during 1920's and 1930's. His book 'The Economic Control of Quality of Manufactured Products' was considered by the statisticians as a landmark contribution to the effort to improve the quality of manufactured goods. He reported that variations exist in every facet of manufacturing but that variations could be understood through the application of simple statistical tools such as sampling and probability analysis.

His techniques taught that work processes could be brought under control by defining when a process should be left alone and when intervention was necessary. His work in sampling and control charts attracted the interest of another statistician, W. Edwards Deming.

The three individuals, W. Edwards Deming, Joseph Juran, and Philip Crosby, have emerged as major international 'philosophers' in the quality revolution. Because of their unique personalities, Deming, Juran, and Crosby have been likened to a fire-and-brimstone preacher, a theologist, and an evangelist, respectively. Deming's gruff demeanor strikes fear into most corporate executives who attend his seminars; Juran's Quality Control Handbook is often called the 'bible' of quality; and Crosby has been recognized for his inspiring and motivational speaking.

2.1.3 W. Edwards Deming

born in 1900 was originally trained as a statistician, and much of his philosophy can be traced to those roots.

Deming focuses on the improvement of the product and service conformance to specifications by reducing uncertainty and variability in the design and manufacturing process. In Deming's view, variation is the chief culpit of poor quality. To achieve reduction of variation he advocates a never - ending cycle of product design, manufacture, test and sales, followed by market surveys, then redesign and so forth. Deming claims that higher quality leads to higher productivity, which in turn leads to long-term competitive strength which is summarized by the Deming 'chain reaction' in Figure 3.

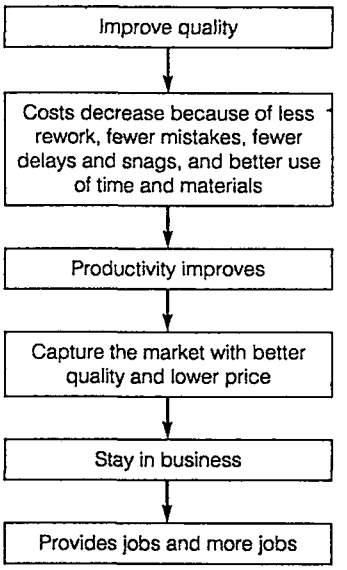


Figure 3. The Deming Chain Reaction

Deming summarized his concepts and principles in a series of fourteen points and seven deadly diseases as shown in Table 1 (Walton, 1986).

Table 1. Deming's Management Principles

7 Deadly Diseases

1. Lack of constancy of purpose
2. Emphasis on short-term profits
3. Evaluation of performance, merit rating, or annual review
4. Mobility of management
5. Management by use of visible figures
6. Excessive medical costs
7. Excessive costs of liability

14 Points

1. Create and publish to all employees a statement of the aims and purposes of the company. The management must demonstrate constantly their commitment to this statement.

2. Learn the new philosophy, top management and everybody.

3. Understand the purpose of inspection, for improvement of processes and reduction of cost.

4. End the practice of awarding business on the basis of price tag alone.

5. Improve constantly or forever the system of production or service.

6. Institute training (for skills).

7. Teach and institute leadership.

8. Drive out fear. Create trust. Create a climate for innovation.

9. Optimize toward the aims and purposes of the company the efforts of teams, groups, staff areas, too.

10. Eliminate the exhortations for the workforce.

11. a) Eliminate numerical quotas for production. Instead, learn and institute methods for improvement.

b) Eliminate M.B.O. (management by objectives). Instead learn capabilities of processes, and how to improve them.

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.

He attempts to separate the common from the special causes that contribute to the variation in product or service quality and thereby allocate correctly the task of improving quality between the manager and the worker. He advocates the use of statistical quality control, since he believes it is 'the statistical understanding of systems that allows accurate diagnosis and solution of problems' (Tenner and DeToro, 1992).

2.1.4 Joseph M. Juran

born in 1900, worked with the Bell System till the start of the World War II, defines quality as 'fitness for use'. This is broken down into four categories: quality of design, quality of conformance, availability and field service. Quality of design focuses on market research, the product concept, and design specifications. Quality of conformance includes technology, manpower, and management.

Availability focuses on reliability, maintainability, and logistic support. Field service quality comprises promptness, competence, and integrity.

His perceptions focus on three major quality processes, called the quality triology: quality planning - the process for preparing to meet quality goals; quality control - the process for meeting quality goals during operations; and quality improvement - the process for breaking through to unprecedented levels of performance.

Many aspects of the Juran philosophy are similar to that of Deming. The focus on management commitment, the need for improvement, the use of quality control techniques, and the importance of training is fundamental to both philosophies. However, Juran does not agree with all that Deming says, such as he believes that Deming is wrong to tell management to drive out fear; 'fear can bring out the best in people', states Juran (Main, 1986).

2.1.5 Philip B. Crosby

a quality advocate made famous in 1979 by his best selling book 'Quality is Free'. He was eminently successful in reducing the manufacturing defects in the production of the missile by embarking on a 'zero-defects' program, which later became the government policy. Crosby's approach to quality is also summarized in fourteen steps as shown in Table 2, but is built around the following four fundamental beliefs, which he calls 'absolutes' (Crosby, 1979) :

i) Quality means conformance to requirements not elegance,

ii) The quality system for suppliers attempting to meet customers' requirements is to do it right the first time - prevention, not inspection,

iii) The performance standard is zero defects,

iv) The management of quality is the cost of quality.

Table 2. Crosby's Quality Management Approach

	Quality Absolutes		Quality Improvement Process
	Conventional Wisdom	Reality	
1. Definition	Goodness	Conformance to Requirements	1. Management Commitment
2. System	Appraisal	Prevention	2. Quality Improvement Team
3. Standard	That's Close Enough	Zero Defects	3. Measurement
4. Measure	Indices	Price of Nonconformance	4. Cost of Quality
			5. Quality Awareness
			6. Corrective Action
			7. Zero Defects Planning
			8. Employee Education
			9. Zero Defects Day
			10. Goal Setting
			11. Error Cause Removal
			12. Recognition
			13. Quality Councils
			14. Do It All Over Again

Two of Crosby's absolutes, zero defects and cost of quality, have been particularly difficult to implement. These two concepts have not been universally accepted, and many organizations have failed to successfully apply them. But in deference to Crosby, these failures may not necessarily reflect the validity of the concepts; instead, they may reflect failures on the part of senior management to implement these approaches correctly.

2.1.6 Armand V. Feigenbaum

a former manager of manufacturing operations and quality control for General Electric, is known for three primary contributions to quality - his international promotion of the quality ethic, his development of the concept of total quality control, and his development of the quality cost classification. The concept of 'total quality control' was picked up by the Japanese and became the foundation for their practice of CWQC - company wide quality control, which began in the 1960's. He originated the concept of 'cost of quality' as a means of quantifying the benefits of developing a total quality management approach. He developed this approach as a result of working with a number of departments in which he encouraged managers to track the costs of failure and the rework necessary to correct the problems. 'The sum of these costs represents 10 to 40 percent of companies' annual sales', says Feigenbaum.

2.1.7 Kaoru Ishikawa

a professor of engineering at Tokyo University, the pioneer of certain quality tools such as the cause and effect diagram, and movements such as quality circles in Japan. He has produced down-to-earth textbooks for quality circle members, concentrating on simple statistical techniques for data collection and presentation, which would help in sorting out and documentation of possible causes of variation and their interrelationships. Such a tool is the cause and effect diagram (or Ishikawa or fishbone diagram), which he first developed in 1943. An important requirement for an effective application of this technique is open group communication and participation, things that Ishikawa viewed as critical.

Ishikawa is also associated with the company-wide quality control (CWQC) movement which started in Japan in the years following the visits of Deming and Juran, and which was concerned with company wide participation in the persuit of quality and its control, from top management to lower-ranking employees, Efforts were concerned with controlling and improving the quality not only for the final product, but also of the management, the after sales service and the company itself (Logothesis, 1992).

The common trust behind the teachings of each of these quality gurus is the concept of continuous improvement. Although their approaches differ in technique, emphasis, and application, the objective is the same - continuous improvement of every output, whether it be a product or a service, by removing unwanted variation and by improving the underlying work processes.

2.2 Quality in Production Systems

It is obvious that quality affects every aspect of an organization. For a product to be successful, the assurance of quality requires a comprehensive systems approach. Thus, collection of all interrelated activities and operations involved in producing goods is called a production system.

Three major areas of quality are critical to any production system: product development, the production process, and product use. Product development and product use are customer-oriented activities. The quality effort in these activities should focus on determining customer needs and service requirements and on translating these needs and requirements into product design that meet fitness for use criteria. The production process includes the physical facilities and information and control systems that are required to convert resources into products. The production process is largely under the control of the business organization. Quality efforts here are oriented toward ensuring that the product conforms to specifications.

A typical production system for manufacturing goods is given in Figure 4.

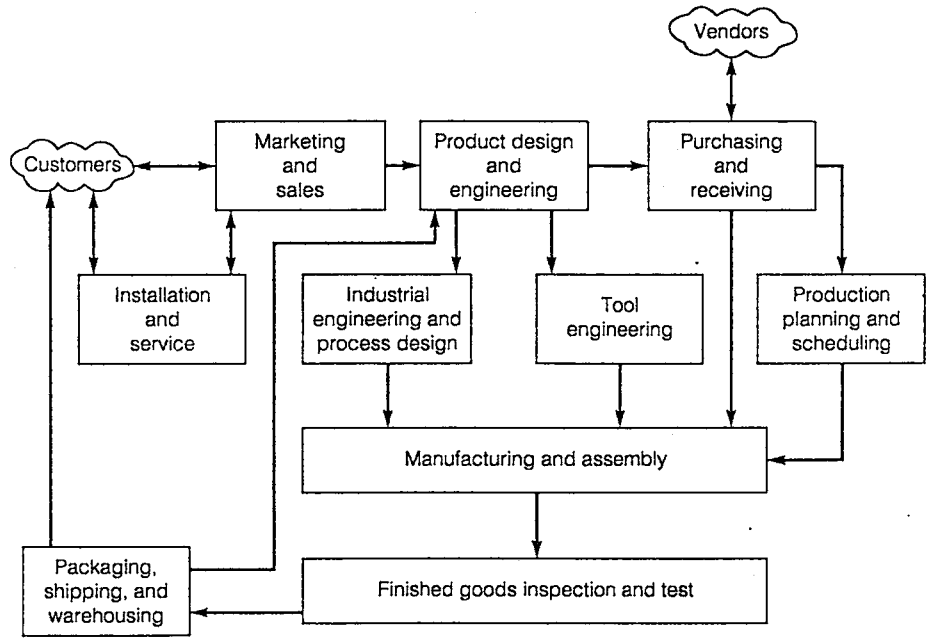


Figure 4. The Production System

2.3 Quality Management Systems

Total Quality Management (TQM), rests first and foremost on the fundamental beliefs, values, and convictions of its leaders. It requires an unflinching persuit to long-term customer satisfaction through the systematic improvement of all products. TQM relies on soft concepts like leadership, respect, trust, and intrinsic motivation. It relies on principles that are impossible to measure.

A quality management system integrates all elements required by an organization to continuously improve customer satisfaction through better products, services and processes. There is no universal prescription, but a number of benchmarks are available that provide operational definitions of TQM to the company managers.

2.3.1 The Deming Prize

Instituted in December 1950 by the Union of Japanese Scientists and Engineers (JUSE), in recognition and appreciation of W. Edwards Deming, The Deming Prize is coveted as the highest form of industrial recognition in Japan. The purpose of this prize is to 'award prizes to those companies which are recognized as having successfully applied Company Wide Quality Control (CWQC) based on statistical quality control and which are likely to keep up with in the future'.

Two major types of awards are made annually. The first is for excellence in research in the theory or application of Statistical Quality Control (SQC). The second is for organizations that have achieved notable results through the application of SQC. This second award is further subdivided into awards for corporations and small enterprises.

2.3.2 The Malcolm Baldrige National Quality Award

This award was established as an attempt to achieve the same results in the United States as the Deming Prize has achieved on Japan. It places greater emphasis on customers than does the Deming Prize, and its guidelines are more detailed and specific.

The Award examination is based on criteria designed to provide a standard of quality excellence for organizations seeking to reach the highest levels of overall quality performance and competitiveness.

It forms a blueprint for quality improvement in any organization and was signed into law on August 20,1987 (Evans and Lindsay, 1993)

2.3.3 The European Quality Award

In October 1991, the European Foundation Commission and the European Organization for quality announced the creation of the European Quality Award.

The Award was designed to increase awareness throughout the European Community, and businesses in particular, of the growing importance of quality to their competitiveness in the increasing global market and to their standards of life. It is also hoped that the award will influence development of quality concepts in educational institutions.

2.3.4 ISO 9000 Inspection Standards

In 1987, to standardize requirements for European countries within the common market and those wishing to do business with those countries, a specialized agency for standardization, the International Organization for Standardization (ISO), adopted a series of written quality standards. The ISO is a powerful body, composed of representatives from the National Standards bodies of 91 nations. The written standards are called the ISO 9000 Series. The American version of the ISO 9000 standards have been relabeled the ANSI/ASAC Q90-1987 series. They contain five sections on the topics shown in Table 3.

Quality awards and standards provide a useful framework for defining the elements of a total quality management system. They also establish a system of measures against which progress can be gauged. However, it may not be possible to codify and quantify the subjective underlying beliefs and culture of an organization that are ultimately required in the never ending guest for long-term customer satisfaction. These ingredients may elude the boundaries of such frameworks.

Table 3. Quality Content of ISO 9000/Q90 Standards

Title By Section	ISO Number	ANSI/ASQC Number
Quality management and quality assurance standards: guidelines for selection and use	9000	Q90
Quality systems: model for quality assurance in design and development, production, installation, and servicing	9001	Q91
Quality systems: model for quality assurance in production and installation	9002	Q92
Quality systems: model for quality assurance in final inspection and test	9003	Q93
Quality management and quality system elements: guidelines	9004	Q94

CHAPTER III

THE ECONOMICS OF QUALITY

Economic considerations play an important role in quality. Quality can have a significant effect on profitability. Each time work must be redone, such as re-manufacturing a defective item or retesting an electronic assembly, costs increase. In pasta production, there is no chance to rework the product. It can be sold as scrap only and money can be gained.

Experts estimate that the cost due to poor quality can range as high as 40 % of total sales with the industry average running close to 25%. Many feel that it should be only about one-tenth of this amount, or about 2.5 % (Evans and Lindsay, 1993). This is clearly an area where substantial savings can be achieved.

In Nuh Pasta Product's company, a quality cost program does not exist. It is believed that their production quality is well enough to satisfy the customer, however, they are discarding about ---- % of their production as scrap. Quality cost data for the company is required for two purposes: to track the effectiveness of the quality assurance program that is suggested throughout this study and to identify quality programs and improvement opportunities.

A quality cost program is needed for the company, however, it should not be forced on the organization. Its value lies in its ability to contribute to customer satisfaction and to profits. This fact needs to be recognized by the top management.

3.1 Quality and Profitability

Profitability is driven by quality. The fundamental economic relationship that determines profit is:

Profit = Revenue - Cost

Revenue = Price X Quantity Sold

To increase profit, one needs to increase revenue or decrease cost. To increase revenue, either price or quantity sold should be increased. Quality is closely related to three items: price, market share and cost.

3.1.1 Quality and Price

The relationship between quality and price is subject to much debate. One theory suggests that higher quality can be produced at a higher cost so higher price implies higher quality. Research studies have found that when other factors such as brand name, store image, product features, or country of manufacture influence consumer perception, quality assessment is not as heavily influenced by price. The company's market share is about 25% in Turkey, and there is a fierce competition in the market. An increase in the price may result with a decrease in the market share.

3.1.2 Quality and Market Share

The relationship between quality and market share often depends on how quality is defined. If the product-based definition applies, that is, if high quality is related to superior performance or quantity of features, the product will generally be more expensive and will sell in smaller quantities. However, if fitness for use definition applies, high quality need not be accomplished by premium prices. The current situation for the company is somewhere between. It has pasta products that are sold at normal market price and it has some superior products that are sold at higher prices.

3.1.3 Quality and Cost

In his book, Quality is Free (Crosby, 1979) Philip Crosby argues that building quality into a product does not cost the company more because of the savings in rework, scrap, and servicing the product after the sale, in addition to benefits of customer satisfaction and repeat sales.

The relationship between quality and profitability is shown in Figure 5. The value of a pasta product in the marketplace is determined by the quality of its design. Improvements in such aspects as performance, features, and reliability will improve the firm's quality reputation and the perceived value of the product, resulting in the company's ability to command higher prices and achieve an increased market share. This in turn leads to increased revenues. These revenues will cover the added costs of improved design, thus defecting the argument that quality increases costs. Improved conformance leads to lower manufacturing costs. The net effect of improved quality of design and conformance is increased profits. For years, many books and articles have presented an economic model for the 'optimum' level of quality of conformance (Evans and Lindsay, 1993). Here a distinction will be made between the traditional economic model for quality and modern viewpoints. In the company, although it is not declared clearly, there is a disbelief that the total cost of quality will outweigh the savings that would be generated. The company managers are curious about what would happen if they took the necessary actions for increasing the general level of quality in the company, and whether it would worth.

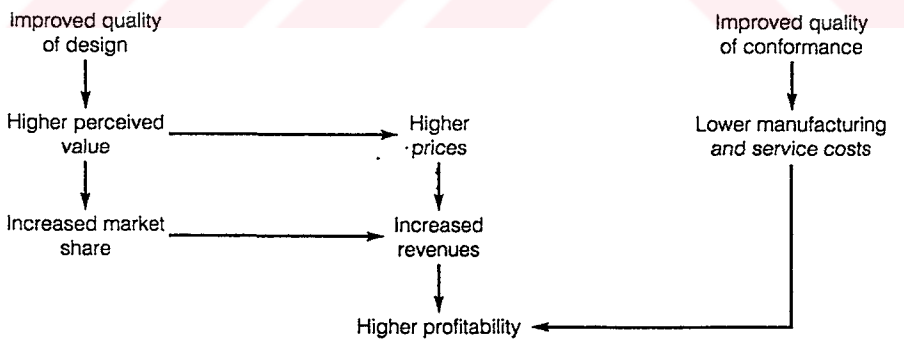


Figure 5. Quality and Profitability

3.2 Traditional Economic Model

Quality costs are incurred by each activity devoted toward assuring conformance to specifications in a production system. These should include, the monitoring of quality costs in relation to the price paid to durum wheat by purchasing department, the guarantee that the incoming durum wheat meets the quality standards, inspection and testing expenses and logistic activities to ensure that no damage occurs in the transportation of the product. These and others are the costs of quality of assurance for the company. The failure to conform to specifications such as the humidity percent, color, packaging of the finished product which are the losses due to poor quality form the costs due to nonconformance.

In fact, throughout the company; there is not a system to measure the costs due to nonconformance. The pasta production process is continuous and there is no chance to rework the product. The amount that is left as scrap is sold as animal feed. The scrap is produced from two sources, from the milling operation in the form of bran and seeds in the production of semolina, and in the production line as a pasta product. First of all a system to measure the amounts and percentages of this scrap is suggested to the management so that they would be aware of the cost of nonconformance. It is thought that, as long as the scrap is sold there is not a problem. However, the chance for a better quality production process is there and the total cost may decrease through the use of high quality.

The classic relationship between the costs of quality assurance and the costs due to nonconformance is given in Figure 6. To the left of the optimum point where the total costs are minimized, there is significant opportunity to improve quality through increased control. However, To the right, the cost of control outweighs the savings that are generated. The company is somewhere at this point, because the main theme in quality control is detection and also their costs due to nonconformance increases though they are not aware of it.

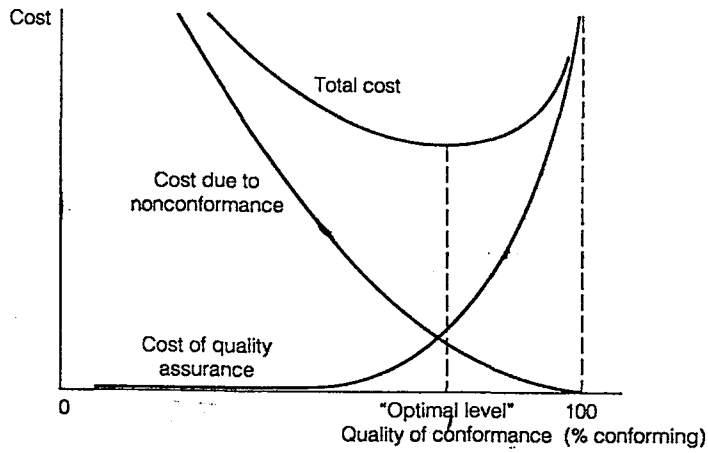


Figure 6. Classic Economic Model of Quality of Conformance

3.3 Modern Economic Model

The model shown above has been used to justify operating at a level of quality conformance less than 100%. As prevention of poor quality becomes a focus, the inherent failure rates of materials and products have been reduced through new technologies, and improvements in automation have been shown to reduce human error during production and appraisal. Thus, to achieve perfection in quality at a finite cost is possible, and the cost of assuring quality does not extend to infinity as 100% conformance is reached. This causes the total quality cost curve to reach its minimum at 100 % conformance justifying the philosophy of continuous improvement shown in Figure 7. This new model is also suggested to the company as an evidence that their main quality theme should be prevention instead of detection so that they can seek 100% conformance after taking necessary actions suggested above.

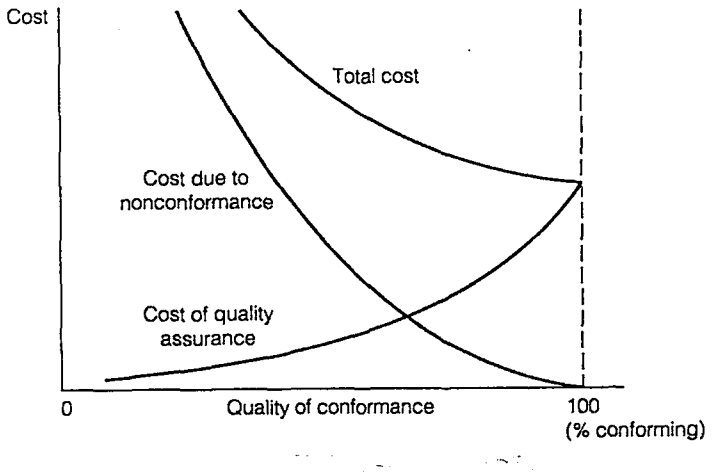


Figure 7. Modern Economic Model of Quality of Conformance

3.4 The Cost of Quality

Cost accounting has traditionally been an important function in businesses. The concept of the cost of quality emerged in the 1950's. The reporting of quality-related costs in the company is limited to inspection and testing; other costs are accumulated in overhead accounts. Throughout the study in the company, it was found that quality related costs were much larger than reported, in the range of 25 -% of sales. Second, it was detected that quality related costs were not only related to production line, but to purchasing, transportation, and customer service departments as well. Most of the costs were the result of poor quality and were avoidable, and while the costs of poor quality are avoidable, there is no clear responsibility for action to reduce them. The organization chart of the company gives some idea about the causes of this situation, the quality control department works on the basis of detection and just suggests the production line to take the necessary actions. In this situation, a cost of quality program to avoid poor quality costs is necessary for the company. The quality cost information obtained would help management to evaluate the relative importance of quality problems and to identify major opportunities for cost reduction, serve as a scoreboard to evaluate the company's success in achieving quality objectives and aid in budgeting.

Quality costs can be organized into four major categories:

I) Basic work costs

ii) Failure costs: external (off-site), and internal (on-site)

iii) Appraisal costs

iv) Prevention costs

Basic work refers to the essential and unavoidable activities required to do the job, that is pasta production. Failure refers to any activity taking place as a result of not meeting requirements the first time. Appraisal refers to the activities of checking whether the requirements has been met and prevention refers to any activity aimed at preventing things going wrong. Ideally, all costs except basic work and prevention costs should be minimal or non-existent (Logothetis, 1992). However, the present situation in the company is just the reverse. They have high failure costs and appraisal costs as they try to detect instead of prevent and have almost no prevention cost. Throughout this study it is tried to be shown that an increase in prevention expenditures will generate savings in all other cost categories. Better prevention of poor quality will clearly reduce internal failure costs, since fewer defective items will be made. External failure costs will also be reduced. In addition, less appraisal will be required, since the products will be made right the first time. Quality costs are both a management responsibility and a technical responsibility. However, for the company, management is not fully aware of the this fact and technical responsibility is on the shoulders of the employees of the quality control department. The actions to eliminate root causes of cost can not be taken properly in this sense.

CHAPTER IV

TOTAL QUALITY MANAGEMENT

4.1 Introduction to TQM

Since the late 40's much has been written and spoken relative to quality control of food processing operations and the quality of finished products. In the past ten to fifteen years, emphasis has been placed on quality assurance. The quality control and quality assurance movement have been a great help to many companies and they have been successful because the products were what they intended to be (Gould, 1992).

Today, the quality assurance effort has shifted from the laboratory to production floor. Each operator in the company should be trained to operate his operation within given specification limits. More importantly, today's plant employee must be a team player. The goals and aspirations of the team are always to help each other and to share the strengths and successes together.

Total Quality Management (TQM) is the modern term to describe how firms are becoming more successful today. It is a new philosophy that sets the stage for the employees working with management, employees having a voice in the operation and employees who feel they are a part of ownership of the firm. Management should recognize the rights of each individual in the and know the meaning of teamwork.

TQM is more than a buzz word, it is management and employees working together for the good of the firm and the ultimate customer. TQM is all about, 'ask not what your firm can do for you, but what you can do for your firm'.

People are the most important asset for a food firm. It is up to the management to provide the right environment, help them to succeed for the growth of the firm and to communicate the values and requirements. Every worker should have his 'tool box', containing tools that will help all employees,

that is, the office person, purchasing personnel, production line operators, warehouse personnel, salesman, marketing manager and even the supervisors and line managers to do the job easier, more reliably, and with unbiased decisions by observed data. Thus all decisions are based on facts, not hearsay.

Total Quality Management, is the only answer to guide Nuh Pasta Products Company, its people, its quality of products, and improve its productivity with the satisfaction of its customers. It will help the firm to meet the fierce competition and build the bottom line.

4.2 Philosophy of TQM

TQM can be defined by understanding each of the three words in Total Quality Management, separately.

Total - means everyone must be involved from the office level, through the factory floor and warehouse, marketing and sales, the company's customers and suppliers. Further total implies everything that employees do in the company, their level of quality, competitiveness in the market place and their overall image and support they give to suppliers, customers, and the public at large.

Quality - the uniform level of quality of products that the company wishes to produce to provide its customers with what they expect with the understanding that it is constantly working to improve quality, but always remaining competitive.

Management - the way the company acts and works with its employees, its equipment, its processes, its suppliers, its customers and the public at large.

Separately, these words are significant unto themselves, but when we put them together, they are the management style used in the successful operation of the business for continued improvement year after year. TQM is the right approach to beat the competition and lead a firm into the next decade with world class quality and productivity that is equal to or better than the competition.

The goals of TQM is to seek business excellence and competitive leadership to satisfy customer expectations. The customer defines the level of quality they expect and it is up to the company to realize that what the customer wants is what the customer should get. In this sense the company needs strategic plans and operational programs to achieve quality leadership in the pasta market.

The TQM strategy for achieving its normative outcomes is rooted in four interlocked assumptions - about quality, people, organizations, and the role of senior management.

The first assumption is about quality, which is assumed to be less costly for an organization than is poor workmanship. A fundamental premise of TQM is that the costs of poor quality are far greater than the costs of developing processes that produce high quality products (Juran, 1974, Ishikawa, 1985, and Deming, 1986).

The second assumption is about people. Employees naturally care about the quality of work they do and will take initiatives to improve it - so long as they are provided with the tools and training that are needed for quality improvement and management pays attention to their ideas (Juran, 1974, Ishikawa, 1985, and Deming, 1986).

The third assumption is that, organizations are systems of highly interdependent parts, and the central problems they face invariably cross traditional functional lines (Juran, 1969, and Deming, 1993).

The final assumption concerns the senior management. Quality is viewed as ultimately and inescapably the responsibility of top management. Employees' work effectiveness is a direct function of the quality of the systems that managers create (Juran, 1974, Ishikawa, 1985, and Deming, 1986).

TQM authorities specify four principles that should guide any organizational interventions intended to improve quality (Hackman and Wageman, 1995).

The first is to focus on work processes. The quality of products and services depends most of all the processes by which they are designed and produced. It is not sufficient to provide clear direction about hoped for outcomes; in addition management must train and coach employees to assess, analyze and improve work processes (Juran, 1974, Ishikawa, 1985, and Deming, 1986).

The second principle is analysis of variability. Uncontrolled variance in processes or outcomes is the primary cause of quality problems and must be analyzed and controlled by those who perform the company's front line work. Only when the root causes of variability have been identified are employees in a position to take appropriate steps to improve work processes (Juran, 1974, Ishikawa, 1985, and Deming, 1986).

The third principle is management by fact. TQM calls for the use of systematically collected data at every point in a problem solving cycle - from determining high priority problems through analyzing their causes to selecting and testing solutions (Juran, 1974, Ishikawa, 1985, and Deming, 1986).

The fourth principle is learning and continuous improvement. The long-term health of an enterprise depends on treating quality improvement as a never-ending quest. Opportunities to develop better methods for carrying out work always exist, and a commitment to continuous improvement ensures that people will never stop learning about the work they do (Juran, 1969, Ishikawa, 1985, and Deming, 1986).

The general framework describing Total Quality Management is given in Figure 8 (U.S. General Accounting Office, 1991). The solid line shows the direction of total quality processes to improve competitiveness. This begins with a leadership dedicated to improve products as well as the quality system. Improvements in this area lead to customer satisfaction and benefits to the organization, both of which improve competitiveness. The dotted lines show the information feedback necessary for continuous improvement. The arrows in the boxes show the expected direction of the performance indicators.

TQM has only three barriers for executing a successful quality improvement program: Top management, middle management, first line management. Management top and down the line must be committed to change and must be visible. They must manage by walking around (MBWA). They must be cheerful leaders, good teachers and listeners. Most importantly, they must have great vision for the firm, its people, its products and its services.

The first requirement for success with TQM is for the Chief Executive Officer (CEO) to adopt and set forth the firm's principles of operation, mission statement, and statement of purpose. The second requirement is for sales and marketing to understand and realize that they are a major part of the total team effort (Gould, 1992).

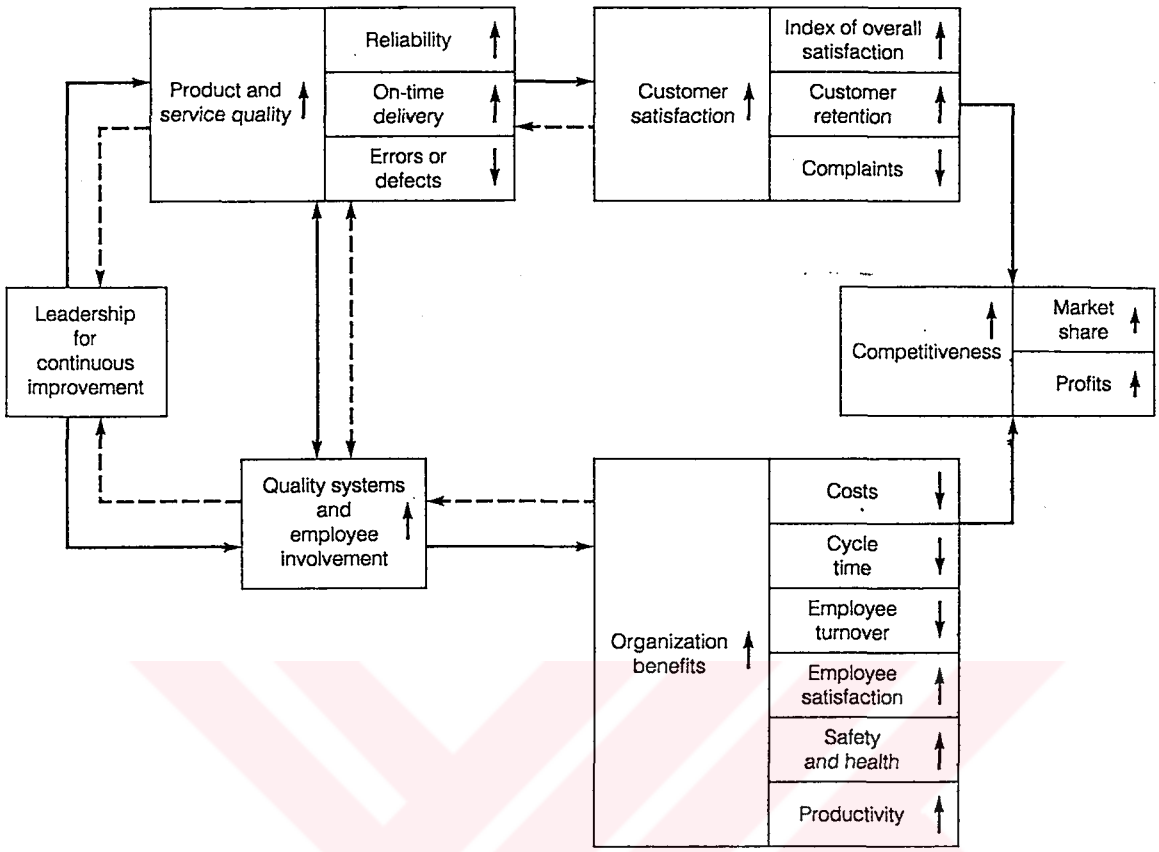


Figure 8. Total Quality Management Model

4.3 TQM Interventions

Despite some differences in emphasis, the TQM authorities have a common philosophical orientation and share a set of core values about people, organization, and change processes. They prescribe five interventions to realize those values.

i) Explicit identification and measurement of customer requirement:

It is essential to know what the customer wants, to provide products that meet the requirements (Ishikawa, 1985). This is partly achieved in the company. Therefore, it is necessary for the organization members to asses directly customer requirements such as durability, reliability, and speed of service (Juran, 1974, and Deming, 1986). TQM defines the next process down the line as the 'customer' for each process so within the company , the assessment of customer requirements should serve as a tool to foster cross-functional operation (Ishikawa, 1985).

ii) Creation of supplier partnership:

It is suggested that organizations should choose vendors on the basis of quality, rather than solely on price. Moreover, it is recommended that organizations work directly with raw material suppliers to ensure that their materials are of the highest quality possible (Juran, 1974, Ishikawa, 1985, Deming, 1986). However, the company works with different vendors and the criteria in choosing vendors is slowly on price. The deficiency of the durum wheat in the national market forces the company to accept whatever is delivered to the production site on the basis of price.

iii) Use of cross-functional teams to identify and solve quality problems:

It is necessary for the company to form cross-functional teams by choosing people who can provide access to the data necessary for testing potential solutions and who are critical to implementing the solutions developed (Juran, 1969). Their main purpose should be to identify and analyze the 'vital few' problems of the organization (Ishikawa, 1985, and Deming, 1993).

iv) Use of scientific methods to monitor performance and to identify points of high leverage for performance improvement:

The three TQM authorities are of one voice in advocating the use of statistical tools to monitor and analyze work processes (Juran, 1974, Ishikawa,

1985, and Deming, 1986). Literally dozens of 'quality tools' have been described in the literature (Sashkin and Kiser, 1993) however, most common used tools are control charts, Pareto analysis and cost of quality analysis. None of the quality tools exist in the company. Only the daily measurements for certain production criteria such as the moisture of the final product, color or protein content is viewed. Therefore it is recommended that the company should use control charts to determine whether the variance produced by the process is random or attribute to specific causes. Proper use of the control charts would allow the company to determine; whether the process is in need of improvement, causes of uncontrolled variance and to reassess the process (Deming, 1986). Pareto analysis should also be performed to identify the major factors that contribute to a problem and to distinguish the 'vital few' from the 'trivial many' causes. Finally, a cost of quality analysis is required to highlight the cost savings that can be achieved by doing the work right the first time. It is vital for the company as this analysis helps to identify the opportunities for improvement that offer the largest cost savings (Juran 1974, and Ishikawa, 1985).

v) Use of process-management heuristics to enhance team effectiveness:

There are several techniques to help quality teams use their collective knowledge efficiency in identifying and analyzing opportunities to improve quality. Among these, flowcharts, brainstorming and cause and effect diagrams are the most commonly used devices (Hackman and Wageman, 1995). Only flowcharting is performed in the company however they stay just there instead of helping members to identify activities that are repetitive (Deming, 1993).

According to the founders of TQM, these interventions define the core of total quality management. Knowledge of customer requirements provides a test for considering and evaluating process changes. Supplier partnerships ensure that the materials entering the organization are of acceptable quality. Cross-functional teams bring the full spectrum of relevant information and expertise to bear on decisions about system wide problems. Scientific methods and systematic analysis provide teams with trustworthy data to use in their decision making and process management heuristics can improve the quality of the decision-making process itself (Hackman and Wageman, 1995).

4.4 Ten Compelling Reasons for TQM

The necessity of a TQM program for the company is given by the following ten reasons (Besterfield, 1986).

i) Quality is profitable: Businesses or companies grow large if they are better at providing quality of their products. The first lesson to be learned is that quality leads to growth and earned market share.

ii) Poor quality is loss making: The penalties of poor quality today are very severe. It is proven statistically that each unhappy customer will tell around ten others about that experience and it costs at least five times as much to attract a new customer as to retain an existing one.

iii) Quality distinguishes: The problem is that everyone seem to go for the same niche at the same time. It is the quality of the product to make the difference.

iv) The customers want it: It all starts with the customer and customer seek out the best to buy. In the pasta market a fierce competition takes place and the company that would first embark on TQM will have the advantage.

v) Competitors are doing it: The two other leading firms of the pasta market, Piyale and Filiz, has got ISO 9002 qualifying standards. The company is also studying on applying for ISO 9002 however proper implementation of TQM is necessary to achieve the results.

vi) The staff will love it: Quality helps by providing purpose, belonging, individual responsibility, challenge and teamwork. It is very rare for an organization to embark on something that affects everyone, which is positive and in which people can share in the results, just starting TQM seems to give a boost to morale.

vii) TQM unites: The most successful TQM programs are those where the quality goals are linked directly to the business goals of the company, that is being the market leader. The inverse of this is that TQM is an excellent vehicle for enabling business goals to be met effectively.

viii) TQM renews: TQM concentrates on management and demands leadership. The resulting environment has a fresher, enthusiastic feel about TQM, with low inertia, and management and staff eager to seek out and take new opportunities.

ix) TQM delivers: Many companies invest in TQM and none doubt the value of the investment. It is up to the threshold to enjoy the multiple benefits, ultimately leading to higher market share.

x) Pride: In fact, TQM is only for good companies as it is managerially demanding, quite complex in implementation and descriptive to business as it is presently run. It can make good companies great that is something to be proud of.

CHAPTER V

PLANNING FOR QUALITY

The company has no organized quality reporting system. There are some sheets used by the quality control department for the analysis and reporting of some factors like humidity, protein content which are given in Appendix B but they are not enough. The company managers primarily confuse the terms planning and decision making. They make decisions without any planning and try to apply them as they were plans. The activity of developing the courses of action, the timing, sequence and implementation of decisions are necessary.

In this respect, it is possible to divide the company managers into three levels: top, middle and supervisory management. Top management should be responsible for setting the broad goals of the organization. In the present situation, the top manager is responsible from everything and as he is the owner of the company there is a one man show going on. Plans should be made by top management to specify the goals that middle managers must accomplish. Middle managers in the company are well educated and eager to apply for the long range plans but they are not directed by the top management. They should have more direction as a larger number of subordinates report to them. At the supervisory or first line management level, much of the time is spent on directing machine operators or clerks. Their primary effort should be devoted to controlling operations according to the directions given by middle management.

The relative emphasis of managerial activities at the management levels of the company should be as shown in Figure 9. Top management should be concerned with long range plans and decisions, middle management with intermediate-range ones and supervisory management with short-range ones. The planning activities for the organization can be placed into one of the three categories; strategic, tactical and operational (Anthony, 1965).

These suggested categories are hierarchical in nature so the strategic plans made at the top levels of the company can be fed downward and provide the boundaries within which tactical plans and decisions should be made. These in turn, should be fed downward and provide boundaries for the operational plans. Broadly speaking, as conceived plans are fed downward through the company, they become more detailed in scope. The suggested hierarchical structure for the company is depicted in Figure 10. This model shows that broad product quality decisions should be made at the top management level, objectives and systems to support the strategic goals should be developed at the middle management level, and detailed procedures for operating control should be carried out at the first line management level. The purpose of developing this hierarchy is to ensure that managerial and operational planning supports rather than hinders the overall direction and strategy of the organization. A well integrated planning structure is the backbone of the total quality assurance system. By this model specific quality decisions are put in the hands of proper managers, who know what they are responsible for and what results are expected. Line of authority which is presently weak in the company become clearer, and deadlines are easier to manage.

Since the planning responsibilities for management tend to increase as a function of the level at which the managers are found, a larger part of the responsibility for overall planning for quality will fall on top and middle management. In the company, The middle level managers need guidance from the top management. The problem for the company starts here as at the top management level the support, willingness and vision for leadership and responsibility is weak. The owner of the company is the CEO and the head of the family business, so this creates some problems in the distribution of authority and mainly in management hierarchy.

At the tactical level, the emphasis is on the design of systems to support product quality and meet strategic goals and objectives. There are efforts in the company to monitor the quality of purchased materials - mainly durum wheat - and these should be canalized to form a vendor quality assurance system which is crucial to overall quality.

At the operational level, control and monitoring is the central activity. The most important point here is to improve working relationship with vendors, setting mutual goals, and cooperating to find solutions to quality problems as they arise.

The company purchases the durum wheat from the national market and works with different vendors over time. It should finance some of the vendors by giving seed, fertilizers or money to increase the quality of the raw material and decrease the number of vendors it is working with. To ensure that the standards defining quality are continuously met and monitor the current quality level, quality measurement and control activity that is currently existing in the company should be developed. More authority and importance should be given to the quality control department in the company so that process capability and improvement studies can be performed.

Level of management	Managerial activity			
	Planning	Organizing	Directing	Controlling
Top	High	Low	Low	Moderate
Middle	Moderate	High	Moderate	Moderate
Supervisory	Low	Low	High	High

Figure 9. Managerial Planning Activities

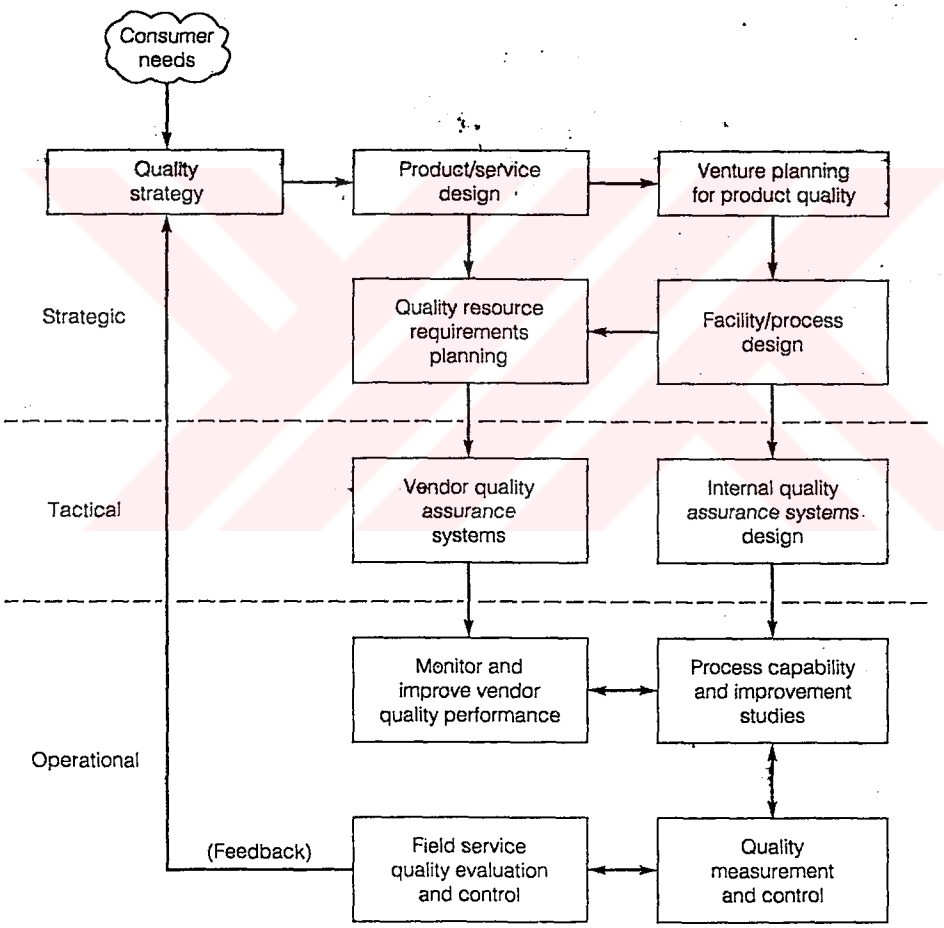


Figure 10. Hierarchical Structure of Quality Planning and Control

5.1 The Quality Planning Process

The common elements of the quality planning process suggested for the company is shown in Figure 11.

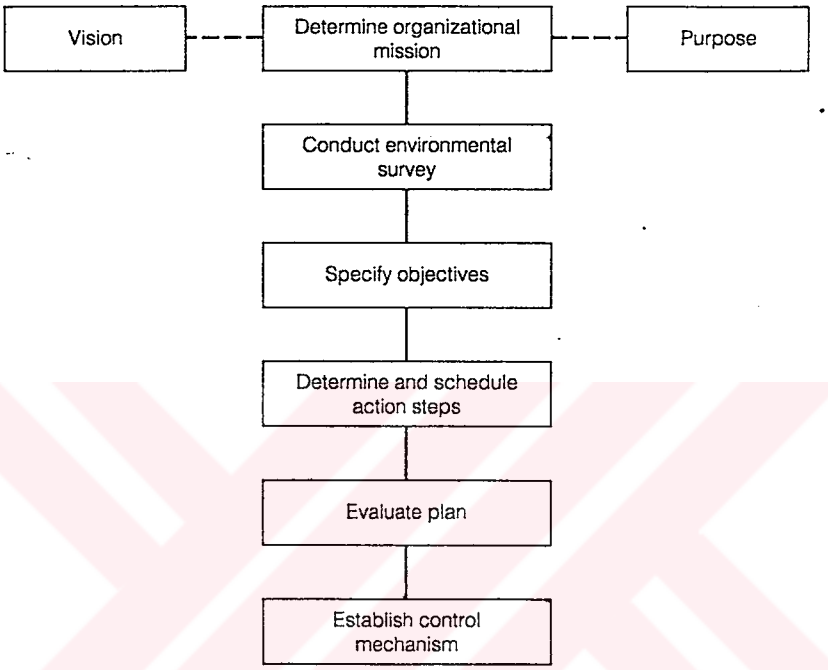


Figure 11. Elements of the Planning Process

'Vision' here refers to guiding values, principles and the direction of expected growth of the company. It should be developed at many levels within the organizational hierarchy. 'Purpose' refers to the reason of existence of the organization. It is currently stated in terms of the product produced, however, it should be stated in terms of customer satisfaction and commitment to strive for higher levels of quality. The vision and purpose of the organization together lead to the organization's mission. The mission of the company is defined in terms of the key products and the markets it intends to serve. However, quality is neglected

in defining the mission of the organization so the following questions should be answered by the company managers,

What should be the quality mission of the company?

What are the key qualities as seen by clients?

As to the key qualities, what is the company's state of competitiveness?

What opportunities does the company have for quality improvement and reduction of quality related costs?

What can the company do to make better use of its human resources?

What threats are coming over the horizon? (Juran, 1982)

The participation of all areas of the organization in determining the quality goals is necessary. The consideration of quality image that the organization wishes to present to its customers is the key component of the mission statement. The purpose of the environmental survey is to gather knowledge about the customer demand, competitive conditions and resource constraints. The next stop is to develop specific measurable objectives, followed by action steps to meet objectives and to schedule actions. The evaluation of the plan should be done in the light of financial constraints. Finally, a control mechanism for measuring results in the light of the objectives need to be devised.

Quality audits are recommended here to monitor the devised quality program. A quality audit is a systematic and independent examination and evaluation to determine whether quality activities and results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives (Evans and Lindsay, 1993).

Its purpose is to generate information on the status of quality assurance in the organization, reveal any inadequacies, and define the scope of improvement. Quality audits, if performed in a timely fashion and in a positive spirit, can be can be invaluable in achieving quality excellence. However, care must be taken not to allow audits to become a trivial exercise, but to provide valuable information to managers.

The development of the objectives for the company can be aided through benchmarking which is 'measurement of performance against that of best in class companies, determining how they achieve these performance levels, and using the information as a basis for the company's targets, strategies and implementation'

(Pryor, 1989). It would help the company to learn its strengths and weaknesses and those of the industrial leaders and to incorporate the best practices into its own operations. The process of benchmarking and the benefits realized through benchmarking is detailed in somewhere else (Bemowski, 1991). Benchmarking is necessary for the company just to see it in the mirror, it can be used to develop superiority in the pasta industry and a tool for continuous improvement.

5.2 Planning for Customer Satisfaction

In a company moving to a TQM philosophy, the focus on the traditional planning elements should be modified. Planning is the first step in Juran's quality triology and he believes that; planning products that meet customers' needs is as important as planning the system to produce those products.

In the company, all quality assurance activities must be customer-driven which is not the case presently. The planning of products and the planning of system must be focused on fulfilling the needs and expectations of the customer to make the product 'fit for use'. The customer needs and expectations can be affected during the production process by the customer-driven quality cycle, given in Figure 12.

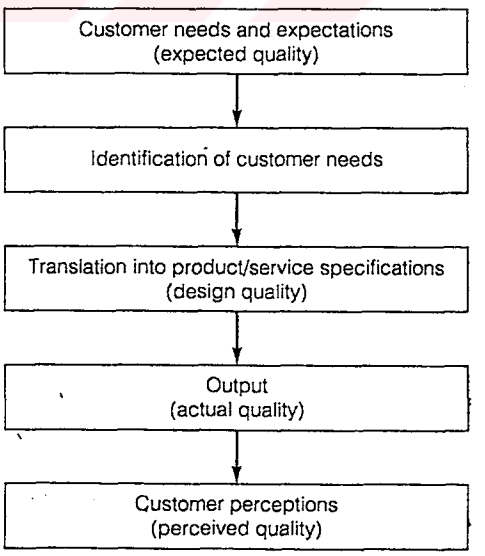


Figure 12. The Customer-Driven Quality Circle

The process begins with customer needs and expectations and ends with what the customer sees and believes the quality of the product to be. In addition to the technical quality characteristic of the pasta product, customers have other needs and expectations throughout the life cycle of product purchase and use (Shores, 1990) such as the color, taste, cooking time, calorie content and the use of additives.

The customer needs should be translated into technical specifications through the design quality of the product, and then to the production line. The company is experienced in this sense that the vitamin added pasta product is in the market today which was a customer need and followed the same path described above. The important thing here is to take the great care to ensure that customer needs are met and exceeded both by the design and production process so that dissatisfaction is prevented.

5.3 Quality Function Deployment

Quality Function Deployment (QFD) is a process which brings the essential elements and crucial characteristics of the various phases in the life cycle of a product, from its conception through design, development, manufacture, distribution and use. It focuses and coordinates skills within an organization, and encourages teamwork between marketing people, design engineers and manufacturing staff. By recognizing the interrelationships between the engineering properties of the product and the customer's requirements, appropriate actions can be taken at every stage of the products' development, so that the customer needs are anticipated, prioritized and effectively incorporated into the product.

The basic QFD procedure to follow is the pictorial construction of the house of quality. The house of quality relates customer attributes to the counterpart characteristics to ensure that engineering decision has a bases in meeting a customer need. Such a system is recommended for the company especially to hear the voices of its customers'. The current organization scheme is not working well in this sense and customer complaints can not be evaluated effectively so that customer satisfaction is a problem for the company and damages the brand name.

On the whole, QFD is very effective for determining opportunities that can be developed effectively to achieve total customer satisfaction. The house of quality is a useful summary of data that can serve as a permanent and complete record of all the relevant available information, thus providing a solid and valuable starting point for future work. Once the targets for the engineering characteristics are decided in the initial house, these can be used as customer attributes in their own right for the construction of a second house concerned with detailed product design. This process can go further through parts deployment, process planning and production, as shown in figure 13.

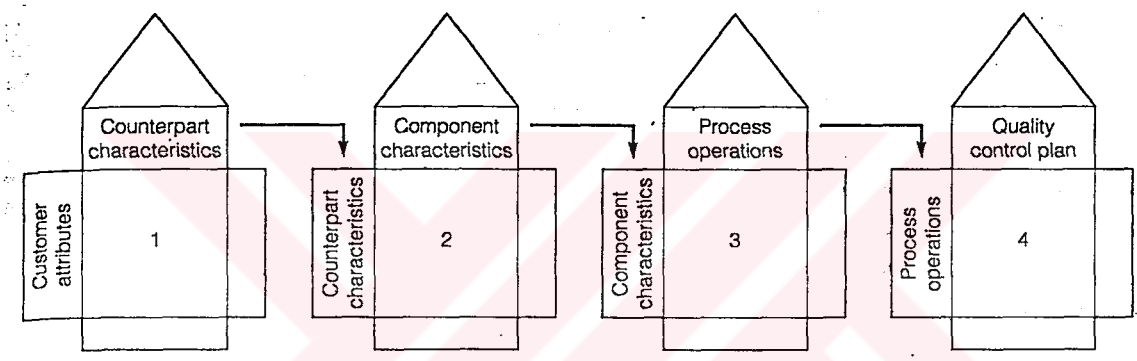


Figure 13. The Four Houses of Quality

CHAPTER VI

ORGANIZING FOR QUALITY

Organization links planning with doing. It is an integral part of the planning process that decides what tasks must be performed and who will carry them out. The formal link between the what and the who of organizing consists of assigning authority, responsibility, reporting lines, and performance standards at each level of the organization. This link is present in the company though it is not visible enough. However, the informal link, which usually makes the difference between a mediocre organization and an excellent one, the corporate culture, is missing. This is a big deficiency for the company as corporate culture, excellence and a total quality philosophy go hand in hand. A corporate culture in the form of 'this is the way we do things at Nuh Pasta Products Company' should be present, at least. Although, its measurement is much more difficult (Peters and Waterman, 1982) its presence is vital for a TQM philosophy.

The three reasons for re-organizing the company are;

I) to establish the links of authority,

ii) to improve efficiency and quality of work through synergism,

iii) to improve communication.

There is a need for an organizational structure that is designed to support the established direction that the company is moving. The company managers were late to make the needed organizational changes though the company grew over time and the need become obvious.

Quality must be an integral part of the production system of the company. Organizational systems influence quality and must be properly addressed for an effective quality assurance. Several factors affect the organizational structure of the company and consequently, the quality organization, these can be listed as:

i) The operational and organizational guidelines of the company;

Standard practices that have developed over the firm's history dictate how the company organizes and operates.

ii) Management style;

Currently, it is formal and autocratic.

iii) Customer influences;

Specifications or administrative controls are not strictly required by customers or governmental agencies.

iv) Company size;

This influences the ability to maintain formal systems and records.

v) Availability of personnel;

This is a big problem for the company as lack of certain skills require other personnel to assume duties that they ordinarily would not be assigned.

The organization structuring is oriented primarily toward ensuring that the organization is effective, that is, doing the right things. However, an equally important requirement is undermined, that is, doing thins right so as to be efficient. Quality requires a simultaneous focus on both issues.

The company, being committed to quality, must examine quality at three levels: the organizational level, the process level, and the performer/job level (Brache and Rummler, 1988). At the organizational level, quality should involve meeting customer requirements, at the process level, organizational units should be classified as departments such as marketing, finance, design, purchasing and at the performer level, standards for outputs must be based on quality and customer service requirements that originate at the other two levels.

The components of quality organization should follow the stages of product development and production. These stages include new design control, incoming material control, manufacturing quality assurance, special process studies, and general management.

The relationship between quality responsibilities and various organizational functions are given in Figure 14 (Feigenbaum, 1983).

Code: (R) = Responsible
C = Must contribute
M = May contribute
I = Is informed

Areas of Responsibility	General Manager	Finance	Marketing	Engineering	Manager Manufacturing	Manufacturing Engineering	Quality Control	Materials	Shop Operations
Determine needs of customer			(R)						
Establish quality level for business	(R)		C	C	C				
Establish product design specs				(R)					
Establish manufacturing process design				C	M	(R)	M	M	C
Produce products to design specs			M	C	C	C	C	C	(R)
Determine process capabilities					I	C	(R)	M	C
Qualify suppliers on quality							C	(R)	
Plan the quality system	(R)		C	C	C	C	(R)	C	C
Plan inspection and test procedures						C	(R)	C	C
Design test and inspection equipment						C	(R)		M
Feed back quality information			C	C	I	M	(R)	C	C
Gather complaint data			(R)						
Analyze complaint data			M	M			(R)		
Obtain corrective action			M	C	C	C	(R)	C	C
Compile quality costs		(R)	C	C	C				
Analyze quality costs		M					(R)		
In-process quality measurements							(R)		C
In-process quality audit				C		C	(R)		
Final product inspection			C	C	M	C	(R)		

Figure 14. Quality Assurance Relationship Chart

6.1 Organization Structure

The organization structure describes the reporting relationships, responsibility and authority to carry out the tasks that meet organizational objectives. It should include the organization chart, job descriptions, policies, procedures, committees and facilities. The presence and absence of each of these will be examined and suggestions will be made in this section.

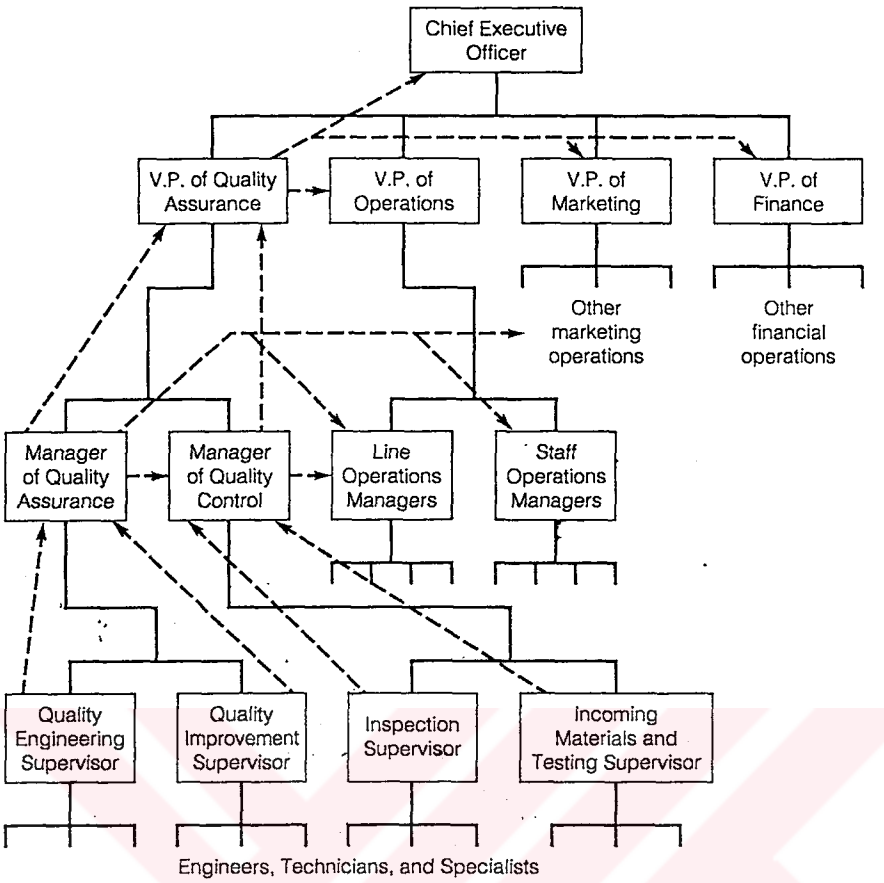
6.1.1 The Organization Chart

The current organization structure is a line organization where the quality function is somewhat invisible except there is a quality control department working on the basis of detection. A line and staff organization is suggested to the company for quality control as depicted in Figure 15 (Feigenbaum, 1983). This is an ideal organization chart showing the formal organizational relationship. A semiformal advisory relationship can be more crucial to a successful quality program, and this depends on the subordinates being the supervisor of the manager in operations, marketing, or even in his or her own department. Because of the superior technical expertise the subordinate will gain the expert label that would provide power to have a suggestion accepted.

6.1.2 Job and Position Descriptions

In the current situation there are no well described and written documents about job and position descriptions. However, they should be present to help managers in assigning responsibilities for certain tasks and in assessing the capabilities of people who will be promoted or recruited to fill in the positions.

The job description detailing the tasks to be performed by anyone having the same title regardless of where that person is assigned in the organization should be developed.



Solid lines show formal authority relationships.
Dotted lines show semiformal advisory relationships.

Figure 15. An Ideal Quality Organization Chart

6.1.3 Policies and Procedures

There are policies and procedures for the organization however, they are not enough to provide the direction in which the organizing effort must flow. New procedures have to be developed to carry out the policies, especially in the selection of qualified vendors to find out durum wheat meeting the quality specifications.

6.1.4 Committees

Complex tasks of design, operations, and quality assurance require coordination between individuals with a variety of interests and specialized talents. Committees, by their nature, can benefit or hinder the coordination process. They should be well managed, so that can be used to transmit information to gather opinions, and gain support for decisions. If misused, they can block progress, foster dissension, and diffuse responsibility to the point of meaningless. It should be kept in mind that power to make decisions can not reside within a committee.

6.1.5 Facilities

They are an important part of the organizing process as they provide the where that the organization needs to carry out its work. The quality control department currently is squeezed in the company. An on-line control system should be used to monitor production quality which requires a significant amount of time and money to be effectively integrated into the production process.

Feigenbaum (1983) suggests, six steps for planning a quality control organization which are the guidelines, and these step should be followed as a check list.

CHAPTER VII

CONTROLLING FOR QUALITY

Control is the third principal managerial function that is vital to an effective quality assurance system. It should be the continuing process of evaluating performance, comparing company's performance to goals and standards that it seeks to attain, and taking corrective action when necessary. The current situation for the control of quality is far away from the above definition. The performance is not evaluated, a hit and miss practice is applied to solve the problems and 'real' corrective actions can not be taken as process of detection instead of process of prevention exists.

The goal of production for the company should be to produce pasta products of consistent quality that meets technical specifications so that both the company and the consumer benefit. The pasta production process consists the following sources of variations shown in Figure 16. Among these, most important ones for the company are variations in raw material, in machines, operators, measurement instruments and human inspection performance. The interaction of these variations form the common causes of variation for the company which is reported to account for 85% of the observed variation in a production process (Evans, 1993). The remaining 15% form the assignable causes of variation of which, their detuction and removal is necessary for the company, so the process would be in statistical control which is not currently.

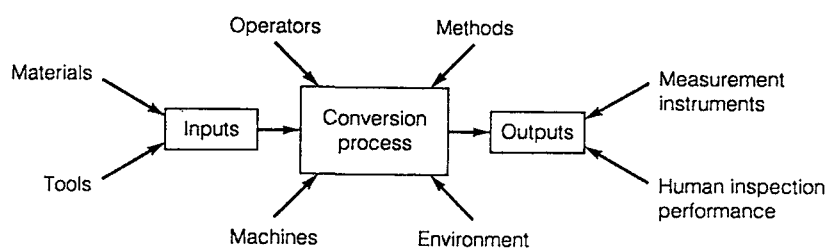


Figure 16. Factors Affecting Variation in Process Output

Any control system should have three components:

i) a standard or goal

ii) a means of measurement of accomplishment

iii) comparison of actual results with the standard along with feedback to form the basis for corrective action.

The last component is missing in the control system of the company. There are standards and measurement methods for the standards but lack of comparison and feedback prevents to take the remedial action on time. Lack of feedback loops also prevent to apply on-line quality control or process control, only some of the off-line methods are applied currently, such as pre-control of incoming durum wheat and package design.

Terry and Franklin (1982), have provided a useful conceptualization of control by dividing it into three stages: preliminary control, concurrent control, and feedback control. This is illustrated within the structure of the general control system model in Figure 17.

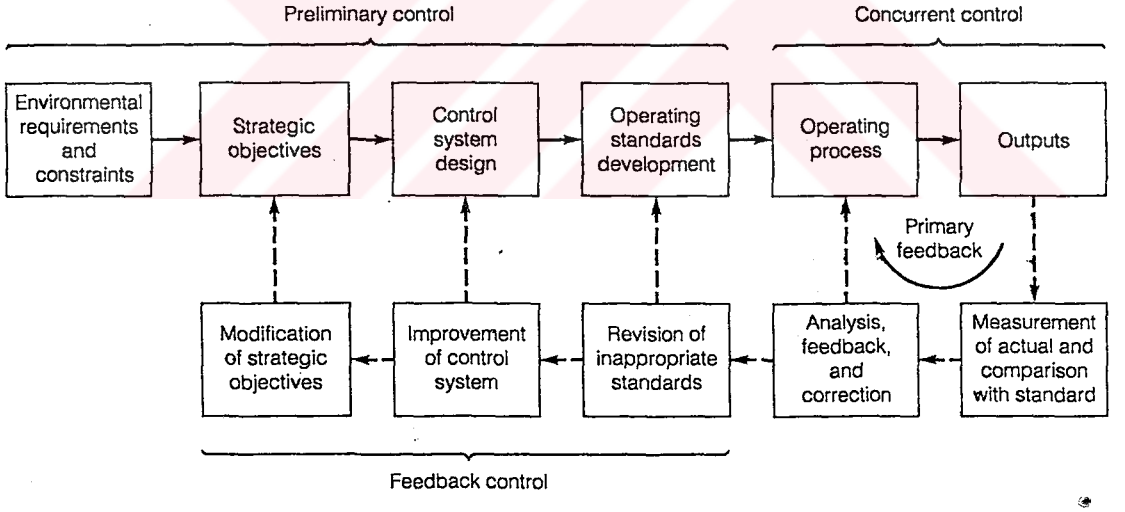


Figure 17. Control System Structure

The purpose of the preliminary control for the company is to ensure that everyone knows how outcomes will be measured and standards are evaluated. Thus, control needs to be built into the system at the planning stage. Preliminary control should include systems for discovering potential quality problems prior to manufacturing operations for pasta.

In the second stage of control, feedback must occur immediately, often in real time, so that errors can be corrected as they happen. This feedback process is called concurrent control which does not exist in the company. This causes big problems as the link between the process errors and necessary corrective actions to be taken, is not present. The outputs from the production process should be measured and compared to the standards. As problems are diagnosed, the pasta production process should be adjusted properly. The major production problems for the company are, the final moisture content and color of the product. They have, sometimes, higher final moisture content of the final product then the standards and the color is weak. These problems can be handled by feedback control which is a necessity from both a human and technical point of view for the company. The engineers with the current situation will never become aware of the problems and will continue to make similar mistakes without feedback.

Feedback control for the company can take many forms. At lower levels of the organization, reports on product quality and process performance should be used for short-term corrective action and as a basis for to propose long-term improvements. These reports should be generated on a daily basis. At higher levels, quality results should be translated into cost of quality reports for upper managers on a less frequent basis. The type of control to the level of management is related in Figure 18 (Terry and Franklin, 1982).

Inspection measurements should form the basis for both product and process control in the company. Inspection for quality should occur at three major points in the production system: at the receipt of incoming durum wheat and purchased parts, during pasta production, and the finished product stage as illustrated in Figure 19. The company currently performs spot-check procedures as an inspection method. A fixed percentage of incoming durum wheat or lots in the production line are selected for inspection.

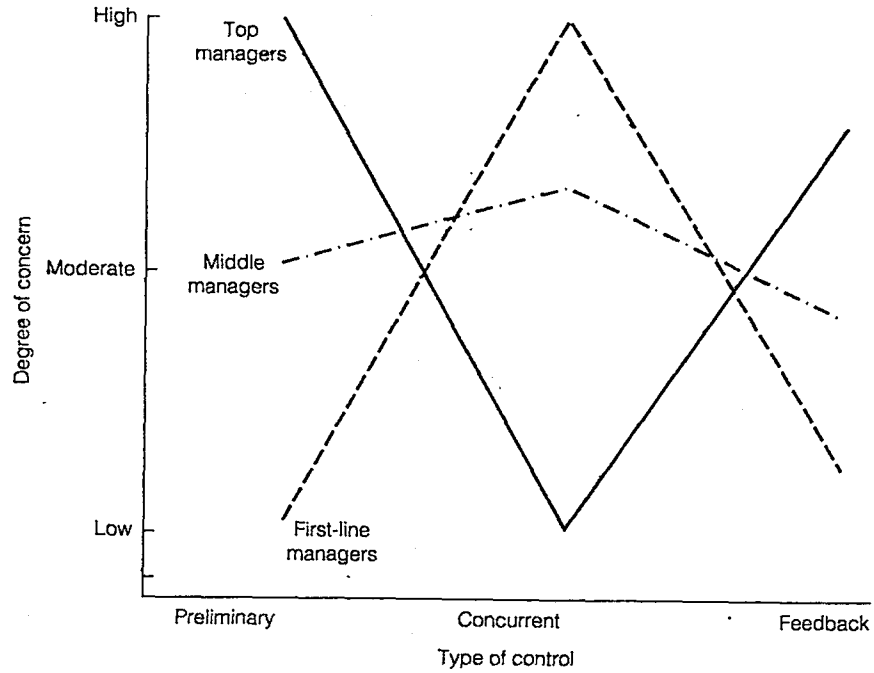


Figure 18. Management Control Emphasis

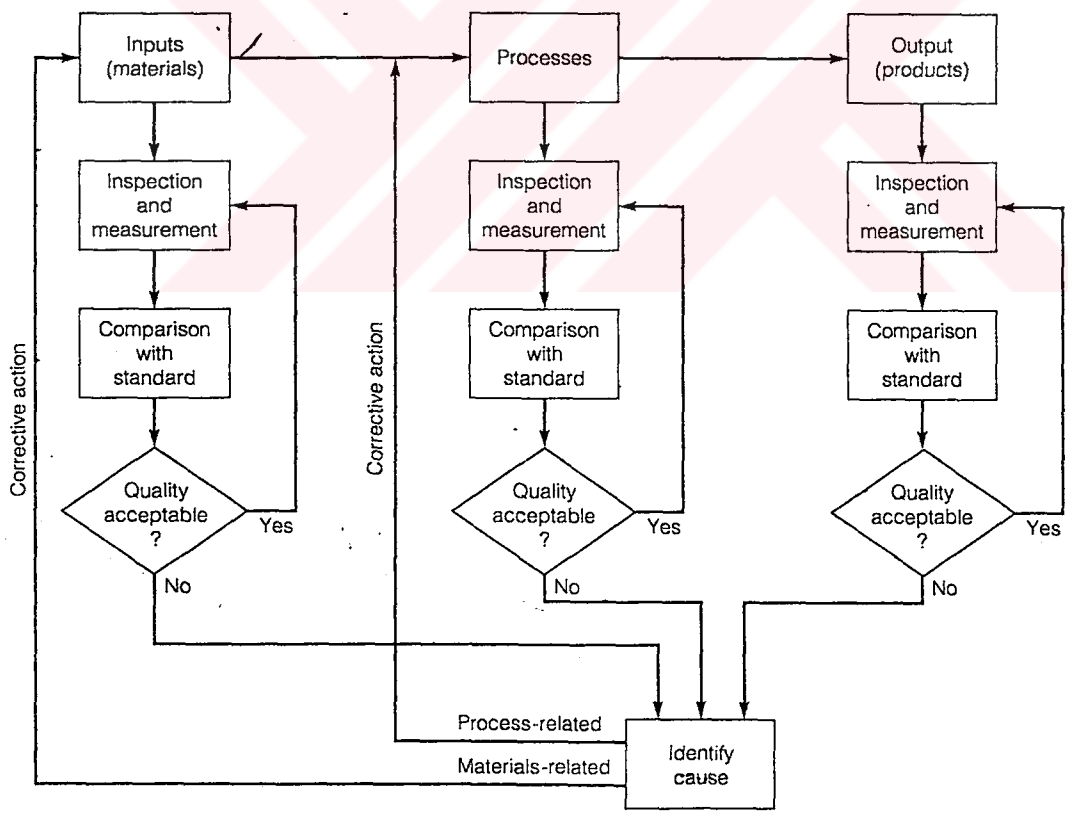


Figure 19. Generic Process Quality Control System

Here, the problem is, the method lacks scientific basis. It does not give an assessment of risk of making an incorrect decision. In fact, it gives different levels of risk for different lot sizes. The company plans to apply for acceptance sampling which is based on taking a statistically determined random sample and using a decision rule to determine acceptance or rejection of the lot based on the observed number of nonconforming items. The general procedure for acceptance sampling is shown in Figure 20. It is thought to be necessary to apply acceptance sapling techniques for having a ISO 9000 certificate. However, the company managers forget the fact that, acceptance sampling is based on a policy of detection, that is, after-the-fact product inspection by quality control personnel not associated with production. The problem here is that a large quantity of nonconforming products might have been made and unnecessary costs will have to be incurred to correct any mistakes. Also, the quality control inspector would not know whether nonconformance was caused by special causes or whether the controlled process is simply not capable of producing to specifications. This can easily result in behavioral problems among manufacturing, engineering, purchasing, and quality personnel; low employee morale and customer dissatisfaction. The best alternative is to maintain ongoing control over the process by the person who knows it best - the operator.

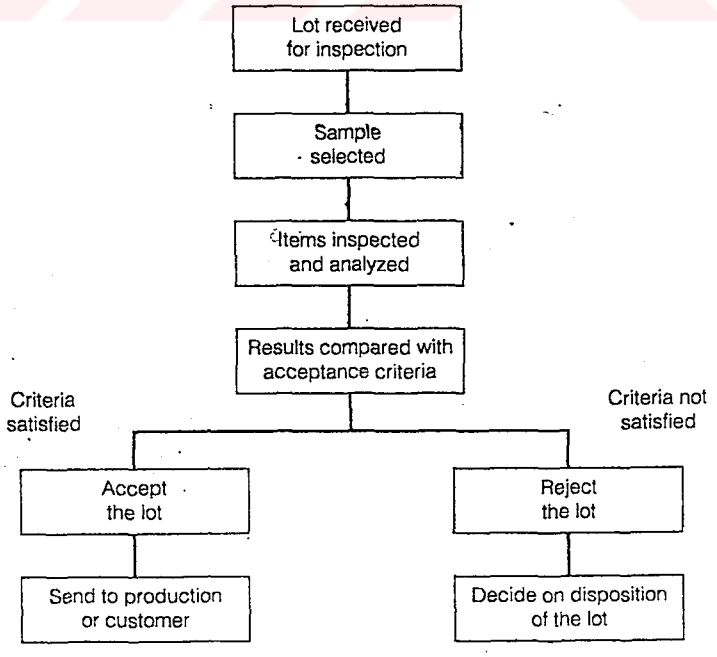


Figure 20. Acceptance Sampling Procedure

Line employees in the company should be trained to recognize when out of control conditions arise. Their responsibility should be to call attention to the problem and help propose solutions. There may be cases which they do not have the expertise or authority to determine process capability, revise specification limits, or make major improvements in the production process. These are all actions that management must take if quality is to be improved with these activities.

This approach of process, rather than product, is a prevention oriented strategy and allows the organization to reduce the variation in its pasta production output. It is simply good management to try to reduce the variation of any quality characteristic. Low variation means greater uniformity of product, higher productivity due to reduction of scrap and rework, and improved competitive position. The last point is worthy of note from the viewpoint of business strategy. As companies in the pasta market produce the same product, the one that can demonstrate more consistent uniformity and quality is likely to receive more business. The survivors in this competitive market will be those with demonstrated quality.

7.1 Control Through Prevention (POKA-YOKE)

On-line methods of process control are better alternatives since they allow corrective action to be taken at the source of production to reduce the defect rate. The most effective approach to controlling quality is a simple one: Prevent defects from occurring at all. The Japanese call this a Zero (defect) Quality Control (ZQC) system which consists of the following processes:

i) Source inspection: Checking for factors that cause errors, not the resulting defect.

ii) 100% inspection: Using inexpensive POKA-YOKE (mistake proofing) devices to inspect automatically for errors or defective operating conditions.

iii) Immediate action: Operations are stopped instantly when a mistake is made and not resumed until it is corrected.

ZQC is based on the fact that human beings tend to make mistakes inadvertently. Mistakes can result from forgetfulness, misunderstanding, errors in

identification, lack of skill, absentmindedness, lack of standards, or equipment malfunctions. Blaming workers not only discourages them and lowers morale, but also does not solve the problem. POKA-YOKE is a technique for avoiding simple human error at work. The idea is to take over repetitive tasks or actions that depend on vigilance or memory so as to free workers' time and minds to pursue more corrective and value-adding activities. Poka-yoke is focused on prediction - recognizing that a defect is about to occur, and detection - recognizing that a defect has occurred. It is an important but hard to achieve method for the company but should be the target for the implementation of TQM program.

7.2 Raw Material Control

Control of incoming raw material depends heavily on purchasing practices and supplier involvement in total quality. One of Deming's 14 Points suggests establishing long-term relationships and moving toward single sourcing of purchased materials. By establishing long-term relationships, the company can work more closely with suppliers to improve the incoming quality of purchased materials. The vendor selections in the company should be made based on quality considerations, not solely on price. However, some incentives should be given to the suppliers in the form of fertilizer, high quality seed and money, to increase cooperation between purchasing departments and vendors so that both suppliers and customers can benefit. There are various supplier rating programs available in the literature (Stundza, 1991, Lovitt, 1989, and Maas, 1988) which are time consuming and expensive to administer. Nevertheless, they are an important means of controlling incoming materials, particularly in a 'just-in-time' environment which is discussed next.

7.3 Just-in-Time as a Quality Control Method

Inventory, any idle good that is held for future use, is a major contributor to poor quality because it hides quality problems; if a part is bad, there is always a back up. Large lot sizes that may have been produced hours, days, or even months ago do not provide proper feedback for identifying and correcting quality

problems. With automation, in particular, high quality materials are essential. In addition, inventory causes excessive material handling, which contributes to cost and does not add value to the product. The Japanese consider inventory simply as a waste.

Just-in-Time (JIT) is the Japanese approach to material management and control (Evans et al., 1991). JIT is more than a new way of handling material management; it represents a philosophy whose objective is to eliminate all sources of waste, including unnecessary inventory and scrap in production. It is described as a 'quality and scrap control tool, as a streamlined plant configuration that raises process yield, as a production line balancing approach, and as an employee involvement and motivational mechanism' (Schonberger, 1982). The basic philosophy is to reduce inventories to as close to zero as possible by producing only enough to keep the next work station in the production process in operation.

JIT can not function properly if production has a high rate of defective items which is the case currently. A TQM philosophy can be strengthened by the immediate feedback on quality that is a natural result of having a JIT system in place. A joint TQM/JIT philosophy focuses on the fact that there must be continuous, intensive effort to coordinate closely all production activities into a single integrated system. Quality is the bonding force that holds the system together. The requirements for linking suppliers, JIT and a TQM philosophy is outlined by Coopers and Lybrand.

For the control of the quality system, a quality audit is required. It is an independent and systematic examination and evaluation to determine whether quality activities and results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives. As such, quality audits provide a means of control over the quality system itself. Quality audits are necessary to the company as:

I) they provide benchmarks for determining whether or not a quality system is complete,

ii) they make everyone aware that the organization is serious about continually improving quality,

iii) they can reveal areas that are inadequate or need improvement

iv) they become a permanent record of the progress in achieving the goals of the quality system,

v) they have become an important part of supplier quality certification systems.

Quality audits, performed on a timely fashion and in a positive spirit, can be invaluable in achieving quality excellence for the company. Care must be taken not to allow audits to become a trivial exercise, but to provide valuable information to company managers.

CHAPTER VIII

QUALITY IMPROVEMENT

After planning, organizing and controlling for quality in the company, the improvement is also necessary. It is believed by many managers that once a commitment to quality has been obtained and steps are taken to design and implement a quality assurance system, their quality problems are over (Evans, 1993). In fact, the problems have just began. Generally, when a new quality assurance system becomes operational, problems that have been covered up for a long time in the company would be discovered. Even after months and years of operation, a good quality assurance program will continue to reveal areas for improvement. So, the company manager's true goal should be the continual improvement of quality. The improvement of quality should be a proactive task of management, not simply a reaction to problems and competitive threats.

The Japanese have a term for improvement - Kaizen (Imai, 1986) which is a philosophy, a way of life, that sublimes all business activities. It has been called 'the key to Japanese competitive success'. In Kaizen philosophy, improvements in all areas of business enhance the *quality of the firm* where it is viewed as improvements in *product* quality, in the west.

Kaizen is different from innovation which results in large, short-term, and radical changes in products or processes. It focuses on small, frequent, and gradual improvements over a long term. People, not technologies, are the principal focus. Kaizen is a process oriented way of thinking rather than a results-oriented approach. Quality improvement in the Kaizen philosophy is first and foremost concerned with the quality of people. If quality of people is improved, than the quality of products will follow. By installing Kaizen into people and training them in basic quality improvement tools, workers can build this philosophy into their work and continually seek improvement in their jobs. This is the process oriented

approach to improvement and encourages constant communication among workers and managers.

How can everyone be involved in improvement activities? is an important question for the company to be answered. Top management should focus on improvement as an important component of corporate strategy, provide support to improvement activities by allocating resources effectively, and building systems, procedures and reward structures that are conductive to improvement. Middle management should implement top management improvement goals by establishing, upgrading, and maintaining operating standards that reflect these goals; by improving cooperation between departments; and by making employees conscious of their responsibility toward improvement and developing their problem solving skills through training. Supervisors can direct more of their attention to improvement rather than 'supervision', provide better guidance for workers, and improve communication. Finally, workers can engage in improvement through suggestion systems and small group activities, self-development programs for problem solving, and enhanced job performance skills.

The foundation for quality improvement in the Kaizen philosophy is the use of statistically based tools for problem solving that ensures problems are addressed objectively using hard data - not opinions or gut feelings. Thus, training is a critical aspect of Kaizen, that should be conducted regularly for all levels of management and workers. Quality control and engineering knowledge should be made available to shop floor personnel so that they can solve their own problems better. Employee involvement teams and suggestion teams are also fundamental to Kaizen (Imai, 1986).

The essence of Kaizen is simple and just plain common sense. In fact, it is difficult to distinguish most of the Kaizen principles from the Deming ideals. But this is not surprising. Kaizen represents the basis for the Japanese business philosophy, and the Japanese philosophy was inspired by Deming's teachings (Logothetis, 1992).

8.1 Problem Solving Methodology for Quality Improvement

Problem solving is a highly creative effort and there are four major components of any problem solving process (VanGundy, 1980):

i) Defining and analyzing the problem.

ii) Generating ideas.

iii) Evaluating and selecting ideas.

iv) Implementing ideas.

In redefining and analyzing a problem, information is collected and organized potential solutions are developed by generating ideas, their evaluation is performed and the solution is put to work.

A variety of structures problem solving processes that refine these general activities has been proposed in literature. The following one is adopted from creative problem solving concepts advocated by Osborn (1963) and Parnes et. al. (1977). This strategy consists of:

i) understanding the 'mess', which is a system of external conditions that produces dissatisfaction (Ackoff, 1973).

ii) finding facts, which is understanding the true state of quality.

iii) identifying specific problems.

iv) generating ideas, brainstorming is a very useful group problem solving procedure, 'for the sole purpose of producing checklist of ideas' (Osborn, 1963).

v) developing solutions, to evaluate ideas and select a method to remove the problem.

vi) implementation.

8.2 Programs for Quality Improvement

Leaders in the quality revolution - Deming, Juran, and Crosby - have proposed specific methodologies for quality improvement. The generic problem solving process described above is applicable to any situation.

8.2.1 The Deming Cycle

The Deming Cycle is a methodology for improvement. It is composed of four strategies: Plan, Do, Study, and Act, as shown in Figure 21. The Plan stage consists of studying the current situation, gathering data and, planning for improvement. In the Do stage, the plan is implemented on a trial basis. The study stage is designed to determine whether the trial plan is working correctly and, Act stage, is the implementation of the final plan to ensure that improvements are standardized. This leads back to the Plan stage for further diagnosis and improvement.

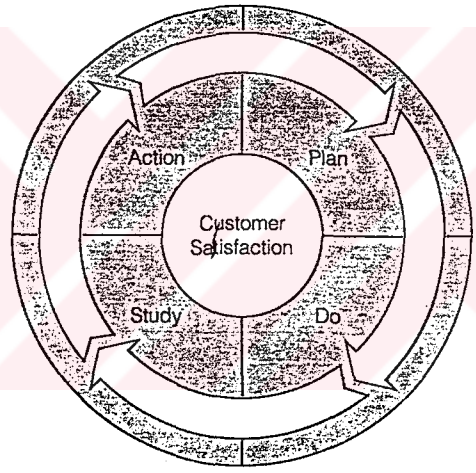


Figure 21. The Deming Cycle

As Figure 21 illustrates, this cycle is never ending, that is, it is focused on continuous improvement. The improved standards are only a springboard for further improvements. This is what distinguishes it from more traditional problem solving approaches and is one of the essential elements of Deming philosophy.

8.2.2 Juran's Improvement Program

Joseph Juran, emphasizes on the importance of developing a habit of making annual improvements in quality and annual reductions in quality related costs. He defines breakthrough, as the accomplishment of any improvement that takes an organization to unprecedented levels of performance. Breakthrough is focused on attacking chronic losses or, in Deming's terminology, common causes of variation. All breakthroughs follow a common sequence of discovery, organization, diagnosis, corrective action, and control. This 'breakthrough sequence' is described and formalized in a series entitled, Juran on Quality Improvement.

8.2.3 The Crosby Program

Philip Crosby proposes a 14 - step program for quality improvement which is given in Table 2.

Seven simple quality control tools are used extensively to improve quality. These tools - flowcharts, check sheets, histograms, Pareto diagrams, cause-and-effect diagrams, scatter diagrams and control charts - are fundamental to Kaizen and Juran's approach to quality improvement. These seven tools are shown in Table 4, in the context of problem solving process. Some of these tools are present in the company like flowcharts, check sheets and control charts but their use and understanding is limited. As they are deceptively simple, they should be redesigned this way so that workers at all levels can use them easily.

Table 4. Creative Problem Solving and Seven Quality Improvement Tools

Problem Solving Step	Useful Tools
Understanding the mess	Flowcharts
Finding facts	Check sheets
Identifying problems	Pareto diagrams
	Histograms
Generating Ideas	Cause and effect diagrams
Developing solutions	Scatter diagrams
Implementation	Control charts

These quality improvement tools can help the company in the problem solving process. Identification of a mess can be aided by drawing a flowchart of the process. Check sheets, histograms, and control charts provide data for fact-finding phase. Pareto analysis helps to identify the most important quality problems. Cause-and-effect diagrams help to facilitate idea finding. Scatter diagrams can be used to validate theories and find a solution. Finally, control charts help to maintain the improvements and gain acceptance from workers.

Seven 'new tools' for quality improvement and problem solving have become popular in recent years. These are, Affinity Diagrams, Interrelationship Digraphs, Tree Diagrams, Matrix Diagrams, Matrix Data Analysis, Process Decision Program Charts (PDCP), and Arrow Diagrams. The details and examples of these are given elsewhere (Brossert, 1991, and Mizuno, 1988).

CHAPTER IX

HUMAN RESOURCE MANAGEMENT FOR QUALITY

Like all businesses, the company has three principal resources: capital, physical and human. The technology used in the pasta market is the same, so the competitive edge can be developed primarily through the human resource. The human resource is the only one that competitors can not copy, and is the only one that can synergize.

Currently, there is no human resource manager in the company. There are personnel managers or personnel administrators who just keep time cards on hourly workers, negotiate contracts with union or sometimes interview job applicants. However, they should perform those activities designed to provide for and coordinate the human resource of the organization (Byars and Rue, 1991). They should take on a strategic role in the company especially when the organization has committed itself to a total quality management philosophy.

The perspectives of Human Resource Management (HRM), can be grouped in two basic areas: human relations and systems. Human relations should include individual, group behavior, and organization development approaches. Motivation is a key notion in understanding individual behavior. Group behavior approaches include social interaction, interpersonal relations, and authority. Organization development should center around leadership.

Systems include industrial engineering; to design jobs to fit technology and human capabilities; labor relations to rely on labor laws, public policies and demographics, and personnel management for recruiting, selecting, training, compensating and development. This structure is shown in Figure 22.

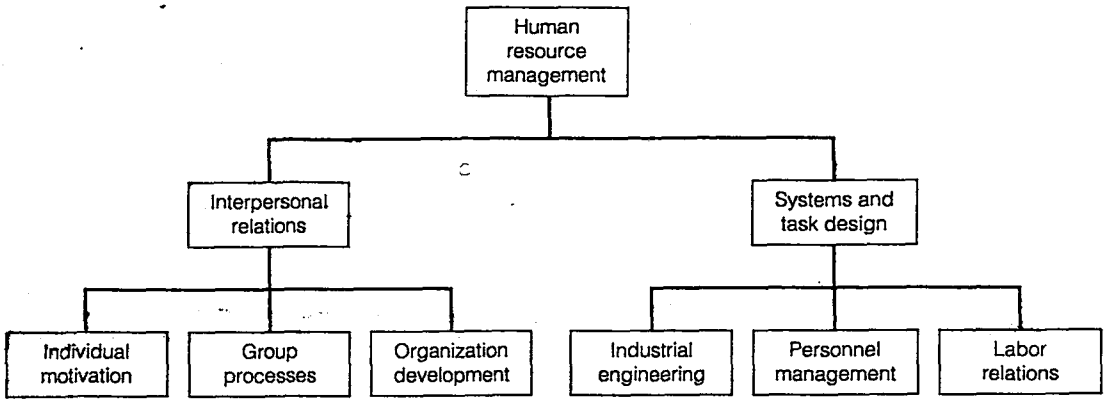


Figure 22. TQM Model of Human Resource Management

9.1 Human Resources Management in a TQM Environment

The TQM focus is changing the role of HRM by changing the perspectives of employees, HRM professionals, and line and staff managers from an adversarial, control oriented relationship to a cooperative position based on mutual organizational and individual goals, trust, and respect. The differences between TQM/HRM and traditional HRM approaches are given in Table 5 (O'Dell, 1986).

The traditional norm in many industries over the years has been the formal, contractual approach to HRM. It is identified with labor relations (with or without union involvement) and industrial engineering perspectives, within the framework of traditional personnel management systems. It has frequently lead to rigid work rules, labor unrest, and 'us-versus-them' thinking which is similar to the current situation in the company. In contrast, the TQM/HRM approach should be used in the company to develop a more cooperative, productive, flexible, and

innovative work environment. Sharing information, responsibility and rewards should be the basis of this approach.

Although there are arguments in literature for the traditional approach, a TQM/HRM approach is strongly suggested to the company as the model. One thing that should not be forgotten is, changes in corporate culture come slowly, and even managers who have adopted the TQM philosophy do not necessarily have the power to monitor their organization and its systems over night.

The strategic aspects of HRM is neglected in the company. It should be noted that HRM can play the key role in developing a viable competitive strategy. The linkage between strategy and HRM structure is explored by Schuler and Jackson (1987). They have outline five areas that affect the design and operation of the HRM system: planning, staffing, appraising, compensating, and training and development. Each of these five areas has dimensions that can be viewed on a continuum from very structured and rigid to very unstructured and flexible. These areas and dimensions are shown in Table 6 (Schuler, 1988).

Table 5. Characteristics of Philosophical Positions

	TQM/HRM Approach	Traditional HRM
Philosophy	Shared responsibility commitment, rewards	Fair day's work for a fair day's pay
Business objectives	Increased quality, productivity, customer satisfaction, employee satisfaction and loyalty	Increased productivity, profitability, quality is secondary; focus on labor
Quality objectives	Total quality management and continuous improvement at across every level	Adequate quality to remain in business; staff driven approaches to quality improvement
Business information sharing	Open books - share broad information on profits, productivity, quality, costs, capital spending plans	Limited to information on an as-needed basis for job performance
Major constituencies	Customers, all employees, stockholders	Managers, stockholders, customers, employees
Employee involvement	Extensive, 'way of life'	Usually no formal system
Education and training	Quality and economic education	On the job training
Reward structure	Designed and adjusted by management-employee committee	Management designed and administered
Job security	A key consideration in all decisions	Labor as a variable cost

Table 6. Human Resource Management Practice Continuae

Planning Choices	
Informal	Formal
Short Term	Long Term
Explicit Job Analysis	Implicit Job Analysis
Job Simplification	Job Enrichment
Low Employee Involvement	High Employee Involvement
Staffing Choices	
Internal Sources	External Sources
Narrow Paths	Broad Paths
Single Ladder	Multiple Ladders
Explicit Criteria	Implicit Criteria
Limited Socialization	Extensive Socialization
Closed Procedures	Open Procedures
Appraising Choices	
Behavioral Criteria	Results Criteria
Low Employee Participation	High Employee Participation
Individual Criteria	Group Criteria
Compensating Choices	
Internal Equity	External Equity
Few Perks	Many Perks
Low Participation	High Participation
Short-term Incentives	Long-term Incentives
Hierarchical	High Participation
Training and Development	
Short Term	Long Term
Narrow Application	Broad Application
Spontaneous, Unplanned	Planned, Systematic
Individual Orientation	Group Orientation
Low Participation	High Participation

There are three competitive strategies that are used by the companies in the pasta market: cost reduction, quality enhancement, and innovation. HRM practices on the left side of each continuum is for cost reduction strategies where short term routine, repetitive, predictable operations are the predominant work mode. On the opposite side of the coin, HRM practices for innovation strategies are present on the right hand side of each continuum. The company currently is somewhere in between but the necessary HRM practices are not performed, primarily due to lack of motivation and leadership.

Leadership is mainly missing in the company, although there is a general manager playing the leader role. The ten managerial roles that leaders must play is given by Mintzberg (1989) as: figure head, leader, liasion, monitor, disseminator, spokesperson, entrepreneur, disturbance handler, resource allocator and negotiator.

The comparison of quality leadership and management practices is given in Figure 23 (Bennis and Nanus, 1985). The company needs a quality leader who envisions future, oversees the development of products having exemplary quality and features, and provides a motivating climate for people while controlling things. It should be noted that good leadership can contribute substantially to high quality, while poor leadership is often a major cause of many quality problems in the organization.

Managers	**Leaders**
Plan Projects	Practice
■ Make plans for the future (on paper)	■ Envision the future
■ Organize materials & methods	■ Optimize materials and methods
■ Preach MBO	■ Use participative management
Push Products	Produce
■ Give "lip-service" to quality	■ Exemplary quality
■ Sell to customers	■ Service to their customers
■ Cut costs	■ Less waste through better processes
■ Perform R&D	■ Innovative products and services
Control People	Motivate People
■ Control people and things through systems	■ Develop people's talents, control things with systems
■ Reward conformance, punish deviation	■ Reward effort, skill development, and innovation; use simultaneous loose-tight controls
■ Maintain status quo	■ Look to the future through continuous improvement

Figure 23. TQM Leadership Contrasts

CHAPTER X

EMPLOYEE INVOLVEMENT AND PARTICIPATIVE MANAGEMENT

One of the most exciting and controversial trends in the TQM movement during the 1980's has been the development of participative team approaches to problem solving and decision making for quality improvement. Participative team approaches involve transforming the culture of the entire organization to top creative energies of all employees.

Today, a number of labels are being applied to various participative team approaches used in organizations. Some of the broad behavioral management approaches have been labeled 'quality of work life (QWL)', 'humanization of work', 'work reform', 'work restructuring', 'work design', and 'sociotechnical systems'. Terms used for employee involvement (EI) teams with such behavioral management programs include QWL teams, productivity action teams (PAT's), and quality circles.

EI is exciting as it offers unprecedented possibilities for tapping the knowledge, enthusiasm, and expertise of people. It promises workers' autonomy over their jobs and gives managers a powerful approach to improve quality and productivity. As the CEO of Ford Motor Company has stated: 'The magic of employee involvement (EI) is that it allows individuals to discover their own potential and to put that potential to work in more creative ways' (Caldwell, 1984).

However, EI is also controversial because it threatens old ways of working and could undermine managerial control. Understanding and accepting the notion of empowering employees is difficult to accept, but EI and participative management are vital components of quality and control.

10.1 The Importance of Employee Participation

Currently, the employees in the company;

i) have no say in the decision process,

ii) are criticized for poor product quality,

iii) do what they can do under the circumstances,

iv) are not adequately trained,

v) work according to the clock with little regard to process efficiency or product quality.

Effective quality assurance depends on good planing, organization, motivation, and control involving managers, supervisors, and workers. Since these three groups of employees must function together as a team, participative approaches to problem solving are important methods for improving quality and productivity. They are also required for breaking down barriers between labor and management, designers and engineers, line and staff and other groups.

The advantages of EI over the traditional management practices can be summarized as (Gufreda, 1990):

i) replacing the adversarial mentality with trust and cooperation,

ii) developing the skills and leadership capability of individuals, creating a sense of mission and fastering trust,

iii) increasing employee morale and commitment to the organization,

iv) fastering creativity and innovation, the source of competitive advantage,

v) helping people understand quality principles and instilling these into the corporate culture,

vi) allowing employees to solve problems at the source immediately,

vii) improving quality and productivity.

It should be kept in mind that EI has many positive aspects, but that, it is by no means a panacea for all of the problems of management (Kahn, 1975). Employee involvement and participation;

i) takes time and money,

ii) is consistent and significantly related to job satisfaction

iii) is positively related to how well decisions are implemented

iv) is associated with group or unit effectiveness.

10.2 Quality Control Circles

The term quality control circles (QCC's) was coined in Japan in the early 1960's. A quality control circle is a small group of employees from the same work area who meet regularly and voluntarily to identify, solve, and implement solutions to work related problems. They have some unique characteristics as (Thompson, 1982):

i) Quality circles are small groups, ranging from 4 to 15 members. Eight members is considered the norm.

ii) All members come from the same work area. This gives the circle its identity.

iii) The members work under the same supervisor, who is a member of the circle.

iv) Voluntary participation is present, that is everyone has an opportunity to join.

v) Circle members, not management, choose the problems and projects that they will work on, collect all information, analyze the problems, and develop solutions.

vi) Management presentations are given to those managers and technical specialists who would normally make the decision on a proposal.

The success of quality circles is situational. If the organization is not ready to make changes and to struggle with the problems and opportunities of the philosophy, it would be dissatisfied with the results. Patience, learning from mistakes, and making evolutionary improvements is necessary to benefit from the approach.

Today, the term quality circles has become less popular as the notion of employee involvement has broadened in scope and special purpose teams are gaining importance. In this participative management approach, employees are encouraged to take on many of the roles formerly held only by management. The focus on quality and improvement shifts from a passive, management initiated one to a highly active, independent one, with the formation of self managed teams (SMT). SMT is composed of a group of highly trained employees, from 6 to 18, on average, who are fully responsible for turning out a well-defined segment of finished work.

For the company currently, proper implementation of EI teams is necessary. They may be in the form of QC's first and later these can be turned

into SMT. The evaluation of an EI program should also be performed in terms of quality, human resources, and quality costs in order to:

i) convince management to continue its support of the EI program,

ii) assess the need for modifying an EI program to improve effectiveness,

iii) calculate financial rewards from team suggestions,

iv) satisfy managerial expectations for measurement.

CHAPTER XI

PROSPECTS FOR TQM

11.1 Is it really TQM?

To address substantive questions about the effects of TQM on the organization and its members, it is necessary to establish that TQM has actually been installed. To accomplish this task, it is necessary to collect behavioral data to document that the following five core features of TQM are in place:

i) Are organization members assessing customer requirements and measuring performance against these requirements continuously?

ii) Are suppliers chosen on the basis of quality, rather then solely on the basis of cost, and are organization members working with suppliers to improve suppliers' quality practices?

iii) Are members operating interdependently, as teams, across traditional organizational functions, rather than independently or in ways that maintain functional separateness?

iv) Are members using statistics and scientific reasoning to formulate and test hypothesis about work processes and strategies for performance improvement?

v) Are members using process management heuristics to enhance team problem solving and decision making?

It is also necessary to assess the degree to which TQM has been implemented: of 99 papers about the effects of TQM published in academic and practitioner journals between 1989 and 1993, only 4 percent assessed the degree to which TQM interventions actually were in place (Hackman and Wageman, 1995).

TQM, which requires an organizational change can go wrong for two reasons. One, the change may be so ambitious and involve such fundamental alterations of the social system that, for all their potential merit, the organization

can not accommodate to them. Espoused changes may appear to fail when in fact they never got implemented. Two, the changes may be more window-dressing than real, where, old organizational structures and systems remain untouched and continue to generate the same behavioral dynamics as before.

When implemented fully and well, TQM can thread its way between these two extremes (Reger, 1994). TQM changes are real rather than ephemeral, and they are generally consistent with research evidence about the factors that promote performance effectiveness. When TQM does tilt toward one or the other extreme, it invariably is toward interventions that are too modest. The reason is that, TQM, by philosophy and design, skirts four features of work systems that are fundamental to organizational behavior and performance:

i) how front line work is structured,

ii) how gains are allocated,

iii) how opportunities for learning are apportioned,

iv) how authority is distributed.

For TQM, the aspiration is to implement changes that are substantial enough to make a real difference without altering the core premises of the enterprise - in effect, to achieve fundamental change without changing the fundamentals (Grant and Rami, 1994).

11.2 Expected Results

TQM is a set of powerful interventions wrapped in a highly attractive package. With the complete installation of the proposed TQM system, the following results are expected for the company.

The incoming durum wheat is accepted according to the specifications set and not only on the basis of solely price by quality control personnel that are trained in quality control practices and the application and use of statistical quality control techniques.

Poor quality products are not produced because of process of prevention instead of process of detection exists in the company.

Vendors are rated on quality, delivery schedules, and price and are supported by giving incentives.

Employees do their job right as they have the proper direction, tools, knowledge and right environment. They are adequately trained for the task. They are recognized for any improvements in the product quality so that they develop pride and enthusiasm for the job and products they produce.

Management is by walking around (MBWA) mad employees have a voice in the decision making process.

The company measures the process capabilities and controls the process to given specifications with predictions of product quality outcome to ensure that all the resources are properly allocated to support the TQM program.

An up-dated policy statement is present and the values and objectives of the company are promoted to all the employees and the public at large.

Quality is everyone's business in the company. It is planned, predictable and controlled objectively with the help of an up-dated quality manual.

Price of quality is conformance at all times and unit costs of production are lowered.

An active program to investigate, initiate corrective action and respond to customer complaints is present so the company receives compliments.

Marketing and sales personnel are alert to customer's needs and expectations and to the state of the competition.

Teamwork is promoted throughout the company.

The company is certificated for ISO 9000 degree with the full knowledge, understanding and implementation of TQM program.

CHAPTER XII

CONCLUSIONS

It should be noted that there are no short cuts to quality. Improvement requires full commitment and support. There are no quick fixes, extensive training and participation of all the employees are needed.

As a result of full implementation of the designed TQM program, Nuh Pasta Products Company can be the sector leader. With its manager's comprehensive vision, disciplined action management style, it will be successful in exporting pasta products to international markets that is the most challenging mission today. It will also be capable of determining the place of the firm in the industry, or shortly 'benchmarking' .

The launching of TQM will be successful by following the suggestions made throughout the thesis and methods one step at a time. However, in this study, a TQM system is designed and suggested to the company. Its proper implementation is up to the company, namely to the top management and CEO. The time to implement a TQM program varies, based on:

i) the dedication of top management,

ii) the director,

iii) the interest and enthusiasm of the employees for the change,

iv) the size of the firm.

In some cases TQM programs can be implemented in less than one year while the time may extend into third year. The key however, is to get started and to keep the momentum going. It is a never ending job and improvement in productivity, and quality must continue long after the initiation of TQM philosophy, it should be a way of life. It is all up to the leadership, the director and the employees.

The quest for quality is the most challenging, it is most rewarding and most fulfilling. People become happy at their work place and their job is most joyful. It is the only way to lead the company into the next century.

REFERENCES

Ackoff, R., 1973. Beyond Problem Solving, American Institute for Decision Sciences, Boston.

Anthony, R.N., 1965. Planning and Controlling Systems: A Framework for Analysis, Boston.

Bemowski, B., 1991. 'The Benchmarking Bandwagon', Quality Progress, January, pp. 19-24.

Bennis, W., and Nanus, B., 1985. Leaders: The Strategies for Taking Care, Harper and Row, New York.

Besterfield, D.H., 1986. Quality Control, Practice-Hall Ltd., New Jersey.

Brache, A.P., and Rummler, G.A., 1988. 'The Three Levels of Quality', Quality Progress, October, pp. 46-51.

Brossert, J.L., 1991. Quality Function Deployment: A Practitioner's Approach, WI:ASQC Quality Press, Milwaukee.

Byars, L.L., and Rue, L.W., 1991. Human Resource Management, 3 rd. edition, Homewood.

Caldwell, P., 1984. 'Cultivating Human Potential at Ford', The Journal of Business Strategy, Spring, pp. 75.

Crosby, P.B., 1979. Quality is Free; The Art of Making Quality Certain, Mentor Book, New York.

Coopers and Lybrand,. Supplier Participation in Total Quality Control and Just-in-Time, Manufacturing Insights, Newsletter, Cincinnati.

Deming, W.E., 1986. Out of the Crisis, MIT Center for Advanced Engineering Study, Cambridge.

Deming, W.E., 1993. The New Economics for Industry, Government, Education, MIT Center for Advanced Engineering Study, Cambridge.

Evans, J.R., 1991. Applied Production and Operations Management, 3 rd. edition, West Publishing Co., St. Paul.

Evans, J.R., and Lindsay, W.M., 1993. The Management and Control of Quality, West Pub. Co., Minneapolis.

Feigenbaum, A.V., 1983. Total Quality Control, 3 rd edition, McGraw-Hill, New York.

Gould, W.A., 1992. Total Quality Management for the Food Industries, CTI Pub. Inc., Baltimore.

Grant, R.M., and Rami, J., 1994. 'TQM's Challenge to Management Theory and Practice', Sloan Management Review, No. 36, pp. 25-35.

Gufreda, J.J., 1990. Employee Involvement in the Quality Process, Homewood.

Hackman, J.R., and Wageman, R., 1995. 'Total Quality Management: Emprical, Conceptual, and Practical Issues', Administrative Science Quarterly, No: 40, pp. 309-402.

Hoy, K.W., and Cecil, G.M., 1978. Educational Administration: Theory, Research and Practice, 2 nd edition, Random House, New York.

Imai, M., 1986. KAIZEN-The Key to Japan's Competitive Success, McGraw-Hill, New York.

Ishikawa, K. 1985. What is Total Quality Control? The Japanese Way, Prentice-Hall, Englewood Cliffs, New Jersey.

Juran, J.M., 1969. Managerial Breakthrough: A New Concept of the Manager's Job, McGraw-Hill, New York.

Juran, J.M., 1974. The Quality Control Handbook, 3 rd edition, McGraw-Hill, New York.

Juran, J.M., 1982. 'Product Quality....A Perception for the West', Quality, April, pp.16-22.

Kahn, R.L., 1975. In Search of the Hawthorne Effect, Van Nostrand Reinhold, New York.

Logothetis, N., 1992. Managing for Total Quality, Prentice Hall Int. Ltd., UK.

Lovitt, M., 1989. 'Responsive Suppliers Are Smart Suppliers', Quality Progress, June, pp. 50-53.

Maas, R.A., 1988. 'Supplier Certification-A Positive Response to Just-in-Time', Quality Progress, September, pp. 75-80.

Main,J., 1986. 'Under the Spell of the Quality Gurus', Fortune, August, pp. 30-34.

Mintzberg, H., 1989. Mintzberg on Management, The Free Press, New York.

Mizuno, S., 1988. Management for Quality Improvement: The New 7 QC Tools, Productivity Press, Cambridge.

O'Dell, C., 1986. Sharing the Productivity Payoff, West Pub. Co., St. Paul.

Osborn, A., 1963. Applied Imagination, 3 rd edition, Scribners, New York.

Parnes, J., Noller, R.B., and Biondi, A.M., 1977. Guide to Creative Action, Scribners, New York.

Peters, T.J., and Waterman, R.H., 1982. In Search of Excellence, Harper and Row Publishers Inc.

Provost, L.P., and Norman, C.L., 1990. 'Variation Through the Ages', Quality Progress, December, pp. 39-44.

Pryor, L.S., 1989. 'Benchmarking: A Self-Improvement Strategy', The Journal of Business Strategy, November/December, pp. 28-32.

Reger, R.K., 1994. 'Reframing the Organization: Why Implementing Total Quality is Easier Said Than Done', Academy of Management Review, No: 19, pp. 565-584.

Sashkin, M., and Kiser, K.J., 1993. Putting Total Quality Management to Work, Berret-Kohler, San Francisco.

Schonberger, R.J., 1982. Japanese Manufacturing Techniques, The Free Press, New York.

Schuler, R.S., 1988. Readings in Personnel and Human Resource Management, 3 rd edition, West Publishing Co., St. Paul.

Schuler, R.S., and Jackson, S.E., 1987. 'Linking Competitive Strategies With Human Resource Management Practice', Academy of Management Executive, Vol. 1, No: 3, pp. 207-219.

Shores, A.R., 1990. A TQM Approach to Achieving Manufacturing Excellence, WI:ASQC Quality Press, Milwaukee.

Stundza, T., 1991. 'Suppliers on the Hot Seat', Purchasing, January, pp. 92-98.

Tenner, A.R., and DeToro, I.J., 1992. Total Quality Management, Addison-Wesley Pub. Co. Inc., Massachusetts.

Terry, G.R., and Franklin, S.G., 1982. Principles of Management, 8 th edition, Homewood.

Thompson, P.C., 1982. Quality Circles: How to Make Them Work in America, Amacom, New York.

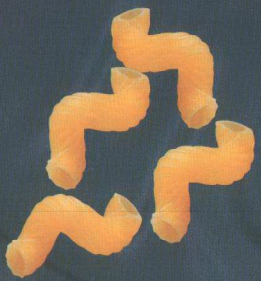
Turner, J.R., 1990. A Quality Technology Primer for Managers, WI:ASQC Quality Press, Milwaukee.

U.S. General Accounting Office, 1991. Management Practices: U.S. Companies Improve Performance Through Quality Efforts.

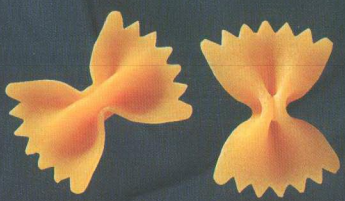
Van Gundy, A., 1980. 'Comparing Little Known Creative Problem Solving Techniques', Creativity Week III, 1980 Proceedings.

Walton, M., 1986. The Deming Management Method, Dodd, Mead and Co., New York.

KLASİK ÇEŞİTLER

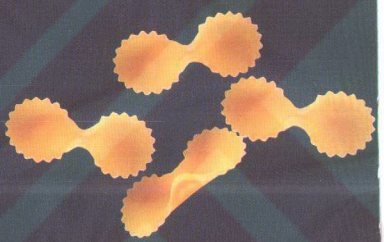


211 BUKLE / SPRİNG



303 KELEBEK / FARFALLE

216 PRİZMA / PRİSM



302 FİYONK / FARFARELLE TONDE

CLASSIC VARIETIES

207 ERİŞTE / TAGLİATELLE

205 DİRSEK / ELBOW

APPENDIX B

KOLİ KONROL FORMU .... / .... / ....

PAK. MAK.	ÜRÜN ÖZELLİKLERİ	I. VARDİYA		II. VARDİYA		III. VARDİYA	
		SAAT	SAAT	SAAT	SAAT	SAAT	SAAT
8	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
9	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
10	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
11	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
12	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
13	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
14	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						

TARİH : ...../...../.....

MAKARNA ÜRETİM AKIŞINDA NEM TAYİN RAPORU

Hat No.	Makarna Cinsi	Numune Alınış Saati	Numune Alınış Yeri		NOT	Hat No.	Makarna Cinsi	Numune Alınış Saati	Numune Alınış Yeri		NOT
			II. T.Ç. S.B.G.	Son Tünel Çıkışı					II. T.Ç. S.B.G.	Son Tünel Çıkışı	
I		08.30				VI		08.30			
		09.....						09.....			
		10.30						10.30			
		11.....						11.....			
		12.....						12.....			
		13.30						13.30			
		14.....						14.....			
		15.30						15.30			
II		08.30				VIII		08.30			
		09.....						09.....			
		10.30						10.30			
		11.....						11.....			
		12.....						12.....			
		13.30						13.30			
		14.....						14.....			
		15.30						15.30			
III		08.30				X		08.30			
		09.....						09.....			
		10.30						10.30			
		11.....						11.....			
		12.....						12.....			
		13.30						13.30			
		14.....						14.....			
		15.30						15.30			
IV		08.30				XI		08.30			
		09.....						09.....			
		10.30						10.30			
		11.....						11.....			
		12.....						12.....			
		13.30						13.30			
		14.....						14.....			
		15.30						15.30			
V		08.30				XII		08.30			
		09.....						09.....			
		10.30						10.30			
		11.....						11.....			
		12.....						12.....			
		13.30						13.30			
		14.....						14.....			
		15.30						15.30			

İMALAT AKIŞINDA NEM RAPORU

...../...../19..... SAAT : 8,30

HAT NO.	NUMUNE CİNSİ	I. TÜNEL ÇIKIŞI	SON BANT GİRİŞİ	SON ÇIKIŞ
1				
2				
3				
4				
5				
6				
8				
10				
11				
12				

İMALAT AKIŞINDA NEM RAPORU

...../...../19..... SAAT : 13,30

HAT NO.	NUMUNE CİNSİ	I. TÜNEL ÇIKIŞI	SON BANT GİRİŞİ	SON ÇIKIŞ
1				
2				
3				
4				
5				
6				
8				
10				
11				
12				

1000 gr. TEMİZLENMİŞ BUĞDAYDA

YABANCI MADDE MİKTARI ANALİZ

R A P O R U

TARİH: ...../...../.....

SİLO BUĞDAYDA 1000 DANE AĞIRLIĞI			% DÖNME MİKTARI					
			SİLO			VALS		
N. ALINIŞ SAAT	% NEM		CİNSİ	TANE ADETİ		TOP. TANE AĞIRLIĞI		TOP. YAB. MADDE AĞIRLIĞI	
	SİLO	VALS		SİLO	VALS	SİLO	VALS	SİLO	VALS
			ÇAVDAR						
			ARPA						
			OT TOHUMU						
			PELEMİR						
			ÇÖP						
			TAŞ						

BUĞDAY VE YAN ÜRÜNLERİ

NEM ANALİZ RAPORU

,nbarda bulunan tavlanmış toplam buğday tonajı :

Silo buğdayda hektolitre ağırlığı :

Yöre olarak çalışılan buğday :

GÜNLÜK — RANDIMAN

DI İrmik	DII İrmik	DIII İrmik	DI+DII+DIII İrmik	DI+DII+DIII İr. Altı Un	DI+DII+DIII Kepek	DI+DII+DIII Razmol	% Nem Kaybı

N. Alınış Saat	N. Alınış Yeri	N. Cinsi	% Nem
	Silo	Buğday	
	Yıkama	»	
	Aktarma	»	
	Değirmen	İrmik	
	»	Un	
	»	Kepek	
	»	Razmol	
	Vals	Buğday	
	»	»	
	»	»	
	»	»	

DIII :

EMKA ANALİZİ

N. ALINIŞ SAATİ	N. ALINIŞ YERİ	ÇUBUK (MAX) 10 SİYAH BENEK SAYISI 100 CM²DE KESME (MAX) 30						% GLUTEN			
		DI. Ç.	DI. K.	DII. Ç.	DII. K.	DIII. Ç.	DIII. K.	DI. + DII. + DIII. KESME İR.		DI. + DII. + DIII. ÇUBUK İR.	
	Değirmen							Y =	K =	Y =	K =

İRMİK NEMİ % :

ELEK ANALİZİ

N. AĞIRLIĞI	ÇUBUK İRMİĞİ							KESME İRMİĞİ							DI+DII+DIII UN
	MİKRON	DI Gram	%	DII Gram	%	DIII Gram	%	MİKRON	DI Gram	%	DII Gram	%	DIII Gram	%	
500 g.	500							500							
	400							400							
	355							355							
	224							224							
	180							180							
	Un							Un							
		KEPEK SAY.		KEPEK SAY.		KEPEK SAY.			KEPEK SAY.		KEPEK SAY.		KEPEK SAY.		

NOT :

MAKARNA NEM TAYİNİ RAPORU (SON TÜNEL ÇIKIŞINDA NEM %)

MAKİNA HAT NO.	NUMUNE CİNSİ	NUMUNE ALINIŞ SAATİ											
I. BÜHLER													
II. BÜHLER													
III. BÜHLER													
IV. BRAİBANTİ													
V. BÜHLER													
VI. BÜHLER													
VII. BÜHLER													
X. BÜHLER													
XI. BÜHLER													
XII. BÜHLER													

BUĞDAY ALIM RAPORU

NUMUNE ALIM SAATİ	:
HEKTOLİTRE AĞIRLIĞI	:
CAMSI TANE	:
RUTUBET	:
YABANCI MADDE	:
TAŞ	:
OT TOHUMU	:
HASAR GÖRMÜŞ TANE	:
DİĞER TAHILLAR	:
DİĞER BUĞDAY	:
BUĞDAY SINIFI	:

BUĞDAY ALIM RAPORU

NUMUNE ALIM SAATİ	:
HEKTOLİTRE AĞIRLIĞI	:
CAMSI TANE	:
RUTUBET	:
YABANCI MADDE	:
TAŞ	:
OT TOHUMU	:
HASAR GÖRMÜŞ TANE	:
DİĞER TAHILLAR	:
DİĞER BUĞDAY	:
BUĞDAY SINIFI	:

BUĞDAY ALIM RAPORU

NUMUNE ALIM SAATİ	:
HEKTOLİTRE AĞIRLIĞI	:
CAMSI TANE	:
RUTUBET	:
YABANCI MADDE	:
TAŞ	:
OT TOHUMU	:
HASAR GÖRMÜŞ TANE	:
DİĞER TAHILLAR	:
DİĞER BUĞDAY	:
BUĞDAY SINIFI	:

PAKET KONROL FORMU

.... / .... / ....

PAK. MAK.	ÜRÜN ÖZELLIKLERI	I. VARDIYA		II. VARDIYA		III. VARDIYA	
		SAAT	SAAT	SAAT	SAAT	SAAT	SAAT
8	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
9	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
10	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
11	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
12	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
13	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						
14	MARKASI :						
	CINSI :						
	GÖRÜNÜM :						
	AGIRLIGI : 1						
	2						
	3						
	4						

../../....

HAT NO	CINSI	% NEM mx %13	% PROTEIN KM'DE min %10.5	KÜL MIKTARI KM'DE mx %1	SUYA GEÇEN MADDE MIKTARI mx %10	PISME DURUMU (20 DAK)
1						
2						
3						
4						
5						
6						
8						
10						
11						
12						

PREMİKS / İLAÇ TAKİP FORMU

MALZEME ADI	BİRİMİ	MİKTARI	TARİH

PREMİKS / İLAÇ TAKİP FORMU

MALZEME ADI	BİRİMİ	MİKTARI	TARİH

KUTU/BOBiN GiRiS KONTROL FORMU

TARIH	KUTU/BOBIN ADI	EBATLAR	YAZILAR	RENK DESEN	AÇIKLAMA (SONUÇ)	KONTROL SORMLUSU