Chapter - 5

Result and Discussion

The results of a research process are shown conceptions of reality or paradigm that the researcher. In research has done, the objectives are translated into research questions formulated from the theory, i.e., are theoretical constructs around a theme or problem.

In this chapter the TQM Methodology will be tested and validated to confirm if the development follows the planned arrangements and to ensure that the resulting TQM Plan is capable of meeting the requirements for the specified application.

As a part of the validation process, a face validation approach has been used, selecting subject matter experts to obtain feedback and external input regarding whether the TQM
Methodology and the TQM Plan are capable of meeting the requirements and deliver the intended results. Face validation relies on natural human intelligence, showing that processes and outcomes are reasonable and plausible within the frame of theoretic basis and implicit knowledge of system experts.

Both finding strongly agree with items, which mean they consider that the methodology is good enough to produce a good TQM Plan for a university. Also, that the Initiation, Assessment and Acceptance phases accomplish their purposes. Both also agree that IAPPA methodology accomplishes its purpose of developing a good TQM Plan, and finally that IAPPA methodology is feasible of being adapted for its use in other sectors or industries beyond the Higher Education setting.

1. Quality leads to lower costs as defects are reduced;

2. Quality is made in the boardroom; it cannot be instilled into shop floor without the initiative and commitment of top management;

3. Most defects are caused by the system not the worker;

4. Inspection is too late; aim to reduce defects during production and eliminate mass inspection;

5. Eliminate numerical quotas, slogans, exhortation and targets for the workforce and promote sustained and continuous improvement of process and quality of output;

6. Drive out fear of change from workers; institute a vigorous program of education, training, and retraining to help the workforce improve continuously and to increase their job security;

7. Break down barriers between staff areas and abandon review systems that will destroy teamwork and create rivalry;

8. End the practice of awarding business on price tag alone; look for suppliers committed to quality and develop long term relationships with them.

Performance measurement is an integral part of all management processes and traditionally has involved management accountants through the use of budgetary control and the development of financial indicators such as return on investment. However, it has been
claimed that conventional aggregate financial accounting indicators are inappropriate in TQM settings. Several authors have claimed that an important part of ensuring that TQM leads to sustained improvements in organizational profitability is that direct quantitative measures of manufacturing are used to assess the effectiveness of managers’ efforts to manage the development and implementation of TQM programmes. With the growing awareness that quality of final products and services is a strategic competitive variable, companies have recognized also that the concept of high quality must be applied to production processes to generate quality products and minimize costs. TQM has evolved as a philosophy that emphasizes the need to provide customers with highly valued products and to do so by improvements in efficiency by way of eliminating waste, reducing lead times at all stages of the production process, reducing costs, developing people, and improving continuously.

While TQM provides a potential for organizations to enhance their competitiveness there is evidence that many organizations have been disappointed in the extent to which TQM has been associated with sustained improvements in organizational profitability. Performance management systems are a cornerstone of human resource (HR) management practices and are the basis for developing a systems approach to organization management. In theory, a performance management system links organizational and employee goals through a goal-setting process, and subsequently links employee goal achievements to a variety of HR management decisions through a performance measurement process.

**TO PROVIDE A CONCEPTUAL ANALYSIS OF TQM WITHIN THE CONTEXT OF ORGANISATIONAL THEORY**

The first purpose of this objective was to provide a conceptual analysis of TQM that would lay the foundation to prepare the institution for implementing TQM. To achieve the aforementioned, it is necessary to understand the different views of researchers in respect of quality and the meaning of TQM. Firstly, in the research literature there appears to be no uniform understanding of the meaning of the term “quality” and even well-known authors seem to have different perspectives of this issue. Although many definitions of quality exist, it was prudent to create a deeper insight into the many definitions of researchers that constitute quality so as to maintain perspective on the subject of managing quality. The
preceding statements imply that it is important for institutions to formulate their own definition of quality in terms of their unique needs and special circumstances. However, a common definition of quality is needed, firstly, to prevent confusion arising amongst personnel members and, secondly, to help resolve any arguments that may arise from time to time within and between departments in an institution. Based on the above-mentioned analysis of quality definitions by different authors, the following definition of quality was developed for this research, namely: “Quality is the degree to which value is added to products and/or service delivery as perceived by all the stakeholders through conformance to specifications and the degree to which excellence is added to products and/or service delivery through a motivated workforce, in order to meet customer satisfaction.” The definition provided places conformance to specifications as the starting point with customer satisfaction at the centre of the institution’s purpose and focus. Defining quality in these terms emphasises two important aspects. Firstly, it reminds managers of their institution’s purpose (“conformance to specifications” as the top priority) and secondly, of the methods to follow in order to achieve customer satisfaction. Although the latter provides the most comprehensive definition, institutions will have to define quality in terms of what it means to them within the context of their specific circumstances. The choice of a “definition”, i.e. what quality means to them, will depend on the specific environment and objectives of the institution. Just as important as the contents of the definition, however, is the way in which quality is communicated in unambiguous terms and understood by all personnel employed at the institution. It was found that “quality and satisfaction are determined ultimately by the customer’s perception of a total product’s value or service relative to its competition”. Therefore, from a systematic point of view, quality will be determined by the stakeholders’ perception of the total institution, its products and services, and its actions relative to their particular requirements.
The second purpose of this objective was to do a conceptual analysis of TQM. The reason for this is that TQM is arguably the most significant of the new ideas that have swept across institutions over the last few years. To achieve an intense understanding of TQM, the following was necessary: (1) a historical review of TQM based on the prescriptions of the quality gurus, (2) a historical evolution from quality to total quality, (3) the principles of TQM, (4) a definition of TQM, and (5) the essentiality and scope of TQM. To understand the origins of TQM, it was important to understand the contributions of several “quality gurus” such as Deming, Juran, Feigenbaum, Crosby and Ishikawa. These researchers laid the foundation for achieving quality excellence and can they therefore be regarded as specialists in the field of TQM. Although they all have their own set of principles in respect of TQM, their general arguments do not differ much from one another. The principles of the five researchers can serve as guidelines for establishing TQM at an institution. However, each one has its own specific strong and weak points, amongst others, to reduce costs and obtain continuous improvement within an institution.

In order to analyse TQM, it was important to understand the reasons why TQM programmes fail, which may provide insight into the importance to understand the meaning of TQM. A thorough understanding was necessary of the barriers that can impede an effective quality transformation. Institutions and authors have identified a variety of reasons why TQM programmes fail and many surveys have been done on this subject. Understanding the barriers that can hinder the success of TQM initiatives is essential for the survival of TQM programmes. It was found that TQM depends on a successful, combined approach to all the previously discussed prescriptions of the gurus underlying principles as well as the avoidance of all TQM obstacles. What is perhaps of greatest importance is the inter-connecters and interaction between the prescriptions of the gurus and the underlying TQM principles. They should reinforce one another and form a synergistic, comprehensive strategy towards TQM.
Following the discussion on the factors that influence TQM, a literature study was done to analyse five international self-assessment models that can be used to enhance improvement in performance at institutions following the TQM philosophy, namely the Deming Prize from Japan, the Malcolm Baldrige National Quality Award from the United States, the European Quality Award from Europe, the South African Excellence Foundation Award from South Africa and the Australian Quality Award. These models were designed to encourage institutions to do self-assessments and to use the information obtained in this manner to improve performance.

**TO PROVIDE AN APPROPRIATE DEFINITION FOR TQM FOR THIS STUDY**

The lack of uniform terminology forms an obstacle for any person who wishes to study, or communicate, in the field of TQM concepts. The purpose of the conceptual analysis in objective one was to find, within the context of this study, an appropriate definition for TQM based on the meaning of quality and quality management. It should be mentioned that TQM is a management philosophy that is generally accepted in America and Europe as one of the most acceptable and widely used strategies to improve the productivity of an institution. As such it was found that total quality has far reaching consequences for the SANDF and SA Air Force. Several definitions are in use to define TQM philosophies, strategies, approaches and processes. A common definition of TQM was needed in this research to prevent confusion arising amongst personnel members and to help resolve any arguments that may arise from time to time within and between departments at an institution. On analysing the various TQM definitions as found in the available literature, it was found that various researchers classify TQM under the following broad headings, namely:

- TQM as a culture.
- TQM as a management and institutional-wide process.
• TQM as a management philosophy and guiding principles.

• TQM as a strategy.

• TQM as a system

Shank and Govindarajan and others argued some time ago that quality practices had become so important that management accounting could no longer ignore TQM. Traditional accounting supports cost and production analysis, but not quality analysis. The thrust of the TQM philosophy is that quality and its management have to be built in from the beginning and that the accomplishment of quality standards and improvement is the responsibility of everyone. Waldman and Gopalakrishnan claim that quality is, in fact, largely a customer perception based on how well the product or service meets the customers’ needs and expectations. Poor quality occurs when these needs are not met. Satisfying the customer is an important aspect of the manufacturing process and this requires the customer’s input at all stages of manufacturing.

Recent research on total quality management has examined the relationships between the Total quality management and organizational performance. Many researchers have examined the link between total quality management (TQM) and financial performance. Researchers such as, provide evidence to show that effective TQM implementations improve long-term profitability and stock returns. Flynn et al. report that higher intensity of TQM practices results in improved quality performance. In a review of the literature covering the relationship between TQM and innovation, Prajogo and Sohal, identified two competing arguments. The first argument suggests that TQM is positively related to innovation performance because it establishes a system and culture that will provide a fertile environment for organizations to innovate. The opposing argument holds that the implementation of TQM principles and practices could hinder organizations from being innovative. There is a growing body of empirical research supporting a direct relationship between the adoption of Total Quality Management (TQM) and improved firm performance. Reed et al. argue that the content of TQM can be distinguished based on the issue of two business orientations: customer orientation and process orientation. With customer orientation, organizations will focus on gaining a market advantage where they can outperform their competitors in terms of attracting more customers with distinguished products and charge a premium price.
Dean and Bowen\(^1\) argue that from a strategic management perspective, TQM is concerned more with strategy implementation, or deployment, rather than strategic choice, or intent. Another strong implication about the association between TQM and cost leadership is suggested by Gobeli and Brown. In their framework on strategic approaches to innovation, they label TQM as a value leader since it places more emphasis on process innovation than product innovation. By focusing on process innovation, TQM can be linked to Porter’s cost leadership strategy. Some studies have found that the use of TQM practices reduces manufacturing process variance, eliminates reworks and scrap, and improves quality performance. In addition, there is considerable anecdotal evidence Harmon and Peterson on the extent to which TQM initiatives enhance the potential for firms to improve their performance. Moreover, some studies have found that TQM firms do not outperform non-TQM firms.

Prior studies suggest that TQM strategy that focuses on increasing customer levels of satisfaction does have a significant and positive impact on performance. Ittner and Larcker, for example, suggest that attaining customer satisfaction is thought to increase the profits of the organization by decreasing costs through fewer returns and increasing revenues through customer loyalty. During the production process, the customer may request access to the quality data used in statistical process control, to evaluate the quality of the goods. Waldman and Gopalakrishnan, Claim that quality is, in fact, largely a customer perception based on how well the product or service meets the customers’ needs and expectations.

There is considerable anecdotal evidence on the extent to which TQM enhances the potential for firms to improve organizational performance. In addition, the empirical findings of Kim and Miller, based on a survey of the manufacturing strategies of 111 firms in the U. S. A., showed that activities associated with TQM (such as conformance quality, product reliability, on-time delivery and performance quality) together with price were the most important capabilities for manufacturing firms in the 1990s. Schmenner (1988) and Schmenner and Cook (1985) demonstrated that throughput time reduction, improved quality and inventory reduction all enhance productivity.

Four components frequently cited as critical to a successful TQM strategy are customer satisfaction, employee involvement, managerial leadership, and process improvement and control. Marketing theory has long recognized the importance of customer satisfaction to the business organization. Quality-focused organizations must identify their customers (both
internal and external), determine the specific needs of these customers, integrate all activities of the organization (including marketing, production, finance, HRM, and IS) to satisfy the needs of these customers, and finally, follow up to ensure the customers have been satisfied. JIT, TQM, and SCM represent alternate approaches to improving the effectiveness and efficiency of an organization’s operations function.

The cost of quality is considered by both Crosby and Juran to be the primary tool for measuring quality. In their approach, it is used to track the effectiveness of the TQM process, select quality improvement projects, and provide cost justification to doubters. By bringing together these easily assembled costs of review, inspection, testing, scrap, and rework, one can convince management and others of the need for quality improvement." Cost of quality has received increasing attention in recent years. It is effective in its intended purpose of raising awareness about quality and communicating to management the benefits of TQM in terms of dollars. Under TQM systems, product/service design efforts have two objectives: designing manufacturable products and designing quality into the products. Designing to simplify manufacturing utilizes cross-functional teams to reduce the number of parts per product and standardize the parts, which results in more efficient process management by reducing process complexity and process variance.

Effective supplier quality management is facilitated by long-term, cooperative relationships with as few suppliers as possible to obtain quality materials and/or services. Maintaining a small number of suppliers improves product quality and productivity of buyers by encouraging enhanced supplier commitment to product design and quality. Quality creates not only a price/value advantage over competitors but also enables the firm to charge a higher per/unit sale price through differentiation. A strategy of high quality leads to a sustainable competitive advantage. Firms competing on quality pursue an operational strategy that controls quality of the product/service and seeks continuous improvement.

The challenges in the future involve effective implementation of the action plan that aims to reduce weaknesses. Future work will involve the measurement and monitoring of performance over the short term period and the use of the results for the continuous improvement of policy and strategy for Quality Assurance. All academic programs will be subject to on-going monitoring and review.
“Quality management” ensures superior quality products and services. Quality of a product can be measured in terms of performance, reliability and durability. Quality is a crucial parameter which differentiates an organization from its competitors. Quality management tools ensure changes in the systems and processes which eventually result in superior quality products and services. Quality management methods such as Total Quality management or Six Sigma have a common goal - to deliver a high quality product. Quality management is essential to create superior quality products which not only meet but also exceed customer satisfaction. Customers need to be satisfied with your brand. Business marketers are successful only when they emphasize on quality rather than quantity. Quality products ensure that you survive the cut throat competition with a smile.

Quality management is essential for customer satisfaction which eventually leads to customer loyalty. How do you think businesses run? Do businesses thrive only on new customers? It is important for every business to have some loyal customers. You need to have some customers who would come back to your organization no matter what.

Would you buy a Nokia mobile again if the previous handset was defective? The answer is NO.

Customers would return to your organization only if they are satisfied with your products and services. Make sure the end-user is happy with your product. Remember, a customer would be happy and satisfied only when your product meets his expectations and fulfills his needs. Understand what the customer expects from you? Find out what actually his need is? Collect relevant data which would give you more insight into customer’s needs and demands. Customer feedbacks should be collected on a regular basis and carefully monitored. Quality management ensures high quality products and services by eliminating defects and incorporating continuous changes and improvements in the system. High quality products in turn lead to loyal and satisfied customers who bring ten new customers along with them. Do not forget that you might save some money by ignoring quality management processes but ultimately lose out on your major customers, thus incurring huge losses. Quality management ensures that you deliver products as per promises made to the customers through various modes of promotions. Quality management tools help an organization to design and create a product which the customer actually wants and desires.
Quality Management ensures increased revenues and higher productivity for the organization. Remember, if an organization is earning, employees are also earning. Employees are frustrated only when their salaries or other payments are not released on time. Yes, money is a strong motivating factor. Would you feel like working if your organization does not give you salary on time? Ask yourself. Salaries are released on time only when there is free cash flow. Implementing Quality management tools ensure high customer loyalty, thus better business, increased cash flow, satisfied employees, healthy workplace and so on. Quality management processes make the organization a better place to work.

Remove unnecessary processes which merely waste employee’s time and do not contribute much to the organization’s productivity. Quality management enables employees to deliver more work in less time.

**Quality management helps organizations to reduce waste and inventory.** It enables employees to work closely with suppliers and incorporate “Just in Time” Philosophy.

In the modern context TQM is thought to require participative management; continuous process improvement; and the utilization of teams. Participative management refers to the intimate involvement of all members of a company in the management process, thus de-emphasizing traditional top-down management methods. In other words, managers set policies and make key decisions only with the input and guidance of the subordinates who will have to implement and adhere to the directives. This technique improves upper management’s grasp of operations and, more importantly, is an important motivator for workers who begin to feel like they have control and ownership of the process in which they participate.

Continuous process improvement, the second characteristic, entails the recognition of small, incremental gains toward the goal of total quality. Large gains are accomplished by small, sustainable improvements over a long term. This concept necessitates a long-term approach by managers and the willingness to invest in the present for benefits that manifest themselves in the future. A corollary of continuous improvement is that workers and managers develop an appreciation for, and confidence in, TQM over a period of time.
Teamwork, the third necessary ingredient for TQM, involves the organization of cross-functional teams within the company. This multidisciplinary team approach helps workers to share knowledge, identify problems and opportunities, derive a comprehensive understanding of their role in the overall process, and align their work goals with those of the organization. The modern "team" was once the "quality circle," a type of unit promoted by Deming. Quality circles are discussed elsewhere in this volume.

For best results TQM requires a long-term, cooperative, planned, holistic approach to business, what some have dubbed a "market share" rather than a "profitability" approach. Thus a company strives to control its market by gaining and holding market share through continuous cost and quality improvements—and will shave profits to achieve control. The profitability approach, on the other hand, emphasizes short-term stockholder returns—and the higher the better. TQM thus suits Japanese corporate culture better than American corporate culture. In the corporate environment of the U.S., the short-term is very important; quarterly results are closely watched and impact the value of stocks; for this reason financial incentives are used to achieve short term results and to reward managers at all levels. Managers are therefore much more empowered than employees—despite attempts to change the corporate culture. For these reasons, possibly, TQM has undergone various changes in emphasis so that different implementations of it are sometimes unrecognizable as the same thing. In fact, the quality movement in the U.S. has moved on to other things: the lean corporation (based on just-in-time sourcing), Six Sigma (a quality measure and related programs of achieving it), and other techniques.

**PRACTICING TQM**

As evident from all of the foregoing, TQM, while emphasizing "quality" in its name, is really a philosophy of management. Quality and price are central in this philosophy because they are seen as effective methods of gaining the customer's attention and holding consumer loyalty. A somewhat discriminating public is thus part of the equation. In an environment where only price matters and consumers meekly put up with the successive removal of services or features in order to get products as cheaply as possible, the strategy will be less successful. Not surprisingly, in the auto sector, where the investment is large and failure can be very costly, the Japanese have made great gains in market share; but trends in other sectors—in retailing, for instance, where labor is imposed on customers through self-service stratagems—a quality orientation seems less obviously rewarding.
For these reasons, the small business looking at an approach to business ideal for its own environment may well adapt TQM if it can see that its clientele will reward this approach. The technique can be applied in service and retail settings as readily as in manufacturing, although measurement of quality will be achieved differently. TQM may, indeed, be a good way for a small business, surrounded by "Big Box" outlets, to reach precisely that small segment of the consuming public that, like the business itself, appreciates a high level of service and high quality products delivered at the most reasonable prices possible.

One of TQM models is deming total quality management philosophy is his famous 14 Points

Most QA experts credit Dr. Deming with providing the foundation of the Japanese quality miracle. He developed the following 14 points for managing the improvement of quality, productivity, and competitive position:

1. Create constancy of purpose for improving products and services.
2. Adopt the new philosophy.
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on price alone; instead, minimize total cost by working with a single supplier.
5. Improve constantly and forever every process for planning, production, and service.
6. Institute training on the job.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the workforce.
11. Eliminate numerical quotas for the workforce and numerical goals for management.
12. Remove barriers that rob people of pride in their work, and eliminate the annual rating or merit system.
13. Institute a vigorous program of education and self-improvement for everyone.
14. Put everybody in the company to work to accomplish the transformation.

Total Quality Management is defined as a continuous effort by management to upgrade and improve the processes and systems to ensure superior quality products. Every organization has to take care of its customers. Their feedbacks are essential. Total Quality management
creates processes and systems based on customer feedbacks and various researches which eventually help in the development of organization.

**Managers play an important role in Total Quality Management:**

Initiating and implementing total quality management programs require great amount of planning and research. Managers need to get trained in various TQM practices before implementing the same. There are costs involved with the entire process of total quality management. It is the manager’s responsibility to allocate budgets for TQM at the beginning of every financial year. Remember, you can’t crib later on. Read a lot about total Quality management.

You need to be convinced first why quality is such an important parameter in every business. If you yourself are not convinced, it would be very difficult for you to convince other departments for implementing TQM. Know who your customers are? Understand your target market carefully. Go out, meet customers and find out as to what all they expect from your brand. Customer feedbacks play an important role in formulating strategies for total quality management. As a manager; you need to work closely with the senior management, human resource professionals to develop foolproof implementation strategies. Remember, a manager has to act as a bridge between the senior management and the entire workforce.

**The role of a manager is to act as a facilitator at the workplace. It is your duty to assist employees in implementing TQM.** As a manager, it is your responsibility to select and appoint right individuals who can work as line managers and take charge of the entire project. The employees, you select ought to be reliable and diligent and should be capable enough to handle a crucial project like total quality management. It is the manager’s responsibility to assign resources for total quality management, allocate time for various training programs and appreciate employees who come up with various improvement ideas and strategies which would help the organization deliver superior quality products. Further train your subordinates to ensure smooth implementation of TQM without any obstacles.

**A manager must communicate the benefits of total quality management to all other members of the organization.** Call employees on a common platform and address the benefits and importance of total quality management. Make them understand how successful implementation of total quality management programs would yield high quality products
which would not only benefit the organization but also the employees associated with the same. Why do we always think of outsourcing trainers? Why can’t we train employees on our own? Believe me, as a manager if you train your employees, the results would be better rather than an unknown face coming and loading them with information. Do not forget, a trainer needs to be prepared for every question. Do your homework carefully.

Quality Management tools help organization collect and analyze data for employees to easily understand and interpret information. Quality Management models require extensive planning and collecting relevant information about end-users. Customer feedbacks and expectations need to be carefully monitored and evaluated to deliver superior quality products.

**Quality Management tools help employees identify the common problems which are occurring repeatedly and also their root causes.** Quality Management tools play a crucial role in improving the quality of products and services. With the help of Quality Management tools employees can easily collect the data as well as organize the collected data which would further help in analyzing the same and eventually come to concrete solutions for better quality products.

Quality Management tools make the data easy to understand and enable employees to identify processes to rectify defects and find solutions to specific problems.

**Following are the quality management tools:**

- **Check List** - Check lists are useful in collecting data and information easily. Check list also helps employees to identify problems which prevent an organization to deliver quality products which would meet and exceed customer expectations. Check lists are nothing but a long list of identified problems which need to be addressed. Once you find a solution to a particular problem, tick it immediately. Employees refer to check list to understand whether the changes incorporated in the system have brought permanent improvement in the organization or not?

- **Pareto Chart** - The credit for Pareto Chart goes to Italian Economist - Wilfredo Pareto. Pareto Chart helps employees to identify the problems, prioritize them and also determine their frequency in the system. Pareto Chart often represented by both bars and a line graph identifies the most common causes of problems and the most
frequently occurring defects. Pareto Chart records the reasons which lead to maximum customer complaints and eventually enables employees to formulate relevant strategies to rectify the most common defects.

- **The Cause and Effect Diagram** - Also referred to as “Fishbone Chart” (because of its shape which resembles the side view of a fish skeleton) and Ishikawa diagrams after its creator Kaoru Ishikawa, Cause and Effect Diagram records causes of a particular and specific problem. The cause and effect diagram plays a crucial role in identifying the root cause of a particular problem and also potential factors which give rise to a common problem at the workplace.

- **Histogram** - Histogram, introduced by Karl Pearson is nothing but a graphical representation showing intensity of a particular problem. Histogram helps identify the cause of problems in the system by the shape as well as width of the distribution.

- **Scatter Diagram** - Scatter Diagram is a quality management tool which helps to analyze relationship between two variables. In a scatter chart, data is represented as points, where each point denotes a value on the horizontal axis and vertical axis.

  Scatter Diagram shows many points which show a relation between two variables.

- **Graphs** - Graphs are the simplest and most commonly used quality management tools. Graphs help to identify whether processes and systems are as per the expected level or not and if not also record the level of deviation from the standard specifications.

Remember, a manager is always a strong source of inspiration for other employees. You need to practice total quality management yourself before expecting others to believe in the same. Customer feedbacks should be carefully monitored and taken into consideration while formulating company’s major strategies. Provide frequent reports to staff members highlighting scope of improvement. There have been numerous studies examining what constitutes TQM, what quality activities most directly affect business performance, what the common barriers to TQM implementation are, and what factors are critical for the success of TQM (Saraph et al. (1989), GAO (1991), Easton (1993), DDI (1993), Ernst and Young (1993), Mann and Kehoe (1994), Plimpton et al. (1996), Black and Porter (1996). Many of these studies are based on surveys of CEOs, middle managers, employees, quality specialists,
and the Baldrige winners, and reflect a fairly common and pragmatic view of TQM. Although these studies have provided slightly different results, some key threads run through them. In an effort to determine if quality improves organizational performance and to identify factors critical to the success of TQM, these studies have identified a common set of principles considered essential to the success of the overall TQM program.

As frequently discussed in the TQM literature, the following have been deemed critical for successful TQM implementation: strong top management leadership and commitment, customer focus, employee involvement and empowerment, a focus on continuous improvement, supplier partnerships, and the recognition of quality as a strategic issue in business planning. The use of SPC and statistical tools, product and service quality in design, performance measures focusing on quality, actions based on facts, and the new role of a quality department and quality specialists are also considered critical. These underlying TQM principles are commonly applicable to any organization and compose a set of key determinants for a successful TQM program. Although these principles prevail in most quality improvement programs, simply adopting them will not guarantee success. It may create confusion unless they are properly implemented. While these principles appear obvious, many organizations have found them very difficult to execute. This is reportedly due to the fact that the implementation is cumbersome, time-consuming, and frequently lacking in focus. Some TQM critics report that the principles are too theoretical and broad to be practical. It is noteworthy that no single approach contains all of the keys to quality, and no cookbook can be equally applied to all company situations and cultures. A combination of many different factors, such as an organizational culture conducive to total quality, the proper quality infrastructure, and system readiness, also contribute to the success or failure of TQM programs.

We do not want to revisit issues related to the definition of TQM and its key principles in this paper because numerous studies have already focused on them. Instead, we focus on implementation issues that have not been discussed but are critical for TQM success. We want to provide managers with additional guidance when considering the implementation or review of a quality program. The lessons described in the following sections are identified through a review of the TQM literature. We believe that lessons can be learned from failures as well as successes, and these lessons can be valuable for the successful implementation of
TQM.

Lessons for Successful TQM Implementation

TQM really means for them before they start a TQM journey. Many do not have a coherent view of what TQM really means except at the most basic level. Raising the following questions will often help companies identify their needs and wants, concerns and capabilities, and help determine focus. What is TQM? Why is TQM necessary? What are the key areas in need of significant improvement? How should we use TQM tools, techniques and practices, and when should we use them? How do we define "success"? On what measures is "success" based? What are the target performance levels in the areas of financial performance, customer satisfaction, employee satisfaction, and quality performance? Are these numerical targets concrete, realistic, and achievable? Often, delusional measurement of success results in failure. Performance should be measured against the company's own, concrete TQM goals, and continual feedback should be used to monitor the progress of the plan.

Knowing who you are, what you do, how you compete, and where you stand in the quality journey would help companies measure the organization's awareness of the need for change, its readiness for planned improvement, and help identify action programs for mobilizing company resources. In light of this, conducting a self-audit or a self-assessment could help identify organizational weaknesses and strengths and identify areas on which efforts and resources should be focused. For this purpose, the criteria and guidelines of the Baldrige Award and ISO 9000 can be used in evaluating a company's current status and designing a company-specific total quality system.

Create a culture that is conducive to and supportive of TQM implementation. The cultural barrier has been one of the frequently mentioned obstacles faced by organizations attempting to implement TQM. Many organizations do an excellent job of committing to total quality by adopting the aforementioned TQM principles, but neglect to create culture conducive to the establishment and continual improvement of quality. It should be recognized that the organization culture interweaves key TQM principles and allows the organization's energies to move in the same direction toward the achievement of total quality. Bounds et al. (1994)
suggest that the following principles be considered for a supportive quality culture:

* The importance of determining what customers value as opposed to what management thinks they need.

* A customer versus an organizational focus.

* A focus on optimizing organizational performance rather than maximizing functional end results.

* The importance of experimentation for knowledge and openness to new information.

* Acceptance of mistakes that lead to organizational learning.

* Recognition of the importance of continuous improvement versus working to specification or adherence to the status quo.

* Recognition that performance improvement comes from process/system improvement and not just improving people.

* Willingness by managers to seek out root causes of problems.

* Understanding that continuous improvement is demanded at every level of the organization.

TQM implementation should be clearly aligned with the company's strategic priorities, competitive environment, and goals. One of the frequently mentioned problems associated with TQM implementation is the fear that it can be counterproductive when combined with other management techniques such as Management By Objectives (MBO). Salegna and Fazel (1995) argue that the success of TQM depends on the organization's implementation plan and
the congruency that exists between the TQM plan and the organization's goals and culture. They suggest that a careful plan is, therefore, required to integrate TQM into the organization's core values, and the implementation process be approached from an integrated system viewpoint and not piecemeal. To this end, it is recommended that everyone in the organization be informed not only of the strategic direction of the business but also of the current imperatives and current performance. Everyone should also understand where they fit in working toward those imperatives and achieving those goals.

Understand the necessary time and effort. Management should set realistic, achievable, and concrete goals rather than trying to encompass too many elements at the same time. Quality action programs should be allowed sufficient time to adapt and assimilate, and a strong resource base is also required. The development of planning through an integrated flowchart often helps identify teams and departments responsible for certain activities, projected completion time, and efforts required for each activity. A pre-implementation plan also helps develop the right attitude and the level of awareness crucial to achieving success in a quality improvement program.

Lesson 5: TQM implementation should be unique to each company. The success of TQM is a function of many variables (both controllable and uncontrollable), and many of them are unique to the company situation. It should be noted that there is no "one-size-fits-all" approach for TQM. Certain quality activities may be more appropriate for some organizations than for others. When establishing quality programs, companies should look for a fit between their current situation and the environment in which they compete, rather than relying on an off-the-shelf TQM package. No single prepackaged quality program or approach can be installed intact in any organization. Each company should custom-make its own program to fit its culture, current practices, and policies (Ernst and Young (1993). For example, the study by Ernst and Young (1993) recommends that lower-performing companies focus on the development of people, customer interaction, process improvement and cost reduction rather than trying to do too much, too soon. Medium performing companies should focus on vendor quality, employee training, cycle time analysis, and process simplification. This study also suggests that the widely touted practices of benchmarking and employee empowerment only had beneficial results for higher-performing companies. As companies progressed from one level of performance to the next, the focus of their quality programs need to expand. Usually,
practices were cumulative, with each level building on the one before. Customer input and employee training were key at all levels of performance.

Take a "holistic" approach. TQM is neither a canned program nor a simple sum of quality tools, techniques, and practices. It requires an effective system to implement target plans. Since the boundary of TQM is so broad and encompasses many disciplines and functional areas, a holistic approach that can integrate many activities is recommended. Interactions between and among departments, functional disciplines, and people at different levels should be recognized and managed to generate a synergistic effect. In light of this, a cross functional systems approach that integrates activities throughout the organization toward strategic objectives and breaks down barriers between departments and levels is often recommended (Bounds et al. (1994). This approach will raise everyone's attention to a higher level, above functional concerns, toward a holistic view of the organization with the purpose of serving customers. Larson and Sinha (1995) provide evidence that the cooperation between people and departments ignites a chain reaction leading to increasing customer and employee satisfaction while improving quality and productivity.

Remember the key word. The term "Total Quality Management" conveys the comprehensive nature of quality improvement activities with emphasis on the word "total" and a broad definition of "quality." This "total" view of quality includes all activities at all levels in all areas, integrating them into a comprehensive approach to continuous improvement. It also necessitates total participation, total commitment, and total responsibility of everyone in an organization (top management, employees, suppliers and customers). While the concept of "totality" is essential to the success of TQM, this somewhat unbounded and ambiguous view has also created confusion among managers as to where to start, how to mobilize organizational resources, and what areas to include. As discussed in Lessons 2 and 5, it is recommended that the organization fully understand its ability (strengths and weaknesses, distinctive competence, limited resources, quality infrastructure such as employees' knowledge and skill base, quality awareness, and organization-wide commitment to quality) to deal effectively with quality-related issues. A myopic view or traditional approach that relies primarily on top management and quality specialists is not recommended.

Understand that TQM is not a "magic bullet" or panacea for quality. Many companies simply jump on the bandwagon without fully understanding what TQM means for them or its
possible consequences. A common misconception includes wishful thinking that TQM will fix short-term problems and quickly improve business performance - a view which is considered to be one of the biggest reasons for TQM failures. As is often said, TQM is not a destination but a journey requiring a long-term, unwavering commitment to the improvement of product or service and process quality. TQM should be considered as a means to an end rather than end in itself.

Implemented properly, TQM can be a powerful vehicle by which companies can achieve excellence in business performance. However, despite the fact that many companies adopt an archetypical TQM framework and its key principles, some of them have not been achieving TQM's potential benefits and have begun to abandon its practices. The TQM framework and key principles should not be blamed for its failure. It is the lack of understanding of what TQM means for each unique organization and how to implement it effectively that has created skepticism on the effectiveness of TQM. In this paper, we have examined several critical issues and provided lessons that may improve the possibility for successful implementation of TQM.

As we have emphasized, the success of TQM depends on many variables, controllable and uncontrollable, many of which are specific to the company's culture, customers, capability, and infrastructure. Therefore, each company should tailor its approach to exploit its unique strengths and focus on its particular weaknesses.

Finally, TQM is not a short-term fix. It is a long-term, never-ending commitment to the improvement of quality and performance. Organizations must be willing to stick with their efforts because results are not usually immediate. Finally, organizations should carefully examine their readiness for certain quality initiatives, keeping in mind the critical stages where certain practices are more appropriate than others.

This feedback from Total Quality Management experts confirm and validate the ability of the TQM Methodology to accomplish its overall purpose.

In this research work we discussed the importance of the Improvement Education Quality System and effective implementation of TQM tools for enhancement the education quality. So,
experiences from the implementation of an education quality enhancement strategy at the State Engineering University of Armenia (SEUA) were presented.

Total Quality is a description of the culture, attitude and organization of a company that aims to provide, and continue to provide, its customers with products and services that satisfy their needs. The culture requires quality in all aspects of the company's operations, with things being done right first time, and defects and waste eradicated from operations.

Many companies have difficulties in implementing TQM. Surveys by consulting firms have found that only 20-36% of companies that have undertaken TQM have achieved either significant or even tangible improvements in quality, productivity, competitiveness or financial return. As a result many people are skeptical about TQM. However, when you look at successful companies you find a much higher percentage of successful TQM implementation.

Some useful messages from results of TQM implementations:

- if you want to be a first-rate company, don't focus on the second-rate companies who can't handle TQM, look at the world-class companies that have adopted it
- the most effective way to spend TQM introduction funds is by training top management, people involved in new product development, and people involved with customers
- it's much easier to introduce EDM/PDM in a company with a TQM culture than in one without TQM. People in companies that have implemented TQM are more likely to have the basic understanding necessary for implementing EDM/PDM. For example, they are more likely to view EDM/PDM as an information and workflow management system supporting the entire product life cycle then as a departmental solution for the management of CAD data

Important aspects of TQM include customer-driven quality, top management leadership and commitment, continuous improvement, fast response, actions based on facts, employee participation, and a TQM culture.
Customer-driven quality

TQM has a customer-first orientation. The customer, not internal activities and constraints, comes first. Customer satisfaction is seen as the company's highest priority. The company believes it will only be successful if customers are satisfied. The TQM company is sensitive to customer requirements and responds rapidly to them. In the TQM context, ‘being sensitive to customer requirements’ goes beyond defect and error reduction, and merely meeting specifications or reducing customer complaints. The concept of requirements is expanded to take in not only product and service attributes that meet basic requirements, but also those that enhance and differentiate them for competitive advantage.

Each part of the company is involved in Total Quality, operating as a customer to some functions and as a supplier to others. The Engineering Department is a supplier to downstream functions such as Manufacturing and Field Service, and has to treat these internal customers with the same sensitivity and responsiveness as it would external customers.

TQM leadership from top management

TQM is a way of life for a company. It has to be introduced and led by top management. This is a key point. Attempts to implement TQM often fail because top management doesn’t lead and get committed - instead it delegates and pays lip service. Commitment and personal
involvement is required from top management in creating and deploying clear quality values and goals consistent with the objectives of the company, and in creating and deploying well-defined systems, methods and performance measures for achieving those goals. These systems and methods guide all quality activities and encourage participation by all employees. The development and use of performance indicators is linked, directly or indirectly, to customer requirements and satisfaction, and to management and employee remuneration.

Continuous improvement

Continuous improvement of all operations and activities is at the heart of TQM. Once it is recognized that customer satisfaction can only be obtained by providing a high-quality product, continuous improvement of the quality of the product is seen as the only way to maintain a high level of customer satisfaction. As well as recognizing the link between product quality and customer satisfaction, TQM also recognizes that product quality is the result of process quality. As a result, there is a focus on continuous improvement of the company's processes. This will lead to an improvement in process quality. In turn this will lead to an improvement in product quality, and to an increase in customer satisfaction. Improvement cycles are encouraged for all the company's activities such as product development, use of EDM/PDM, and the way customer relationships are managed. This implies that all activities include measurement and monitoring of cycle time and responsiveness as a basis for seeking opportunities for improvement.

Elimination of waste is a major component of the continuous improvement approach. There is also a strong emphasis on prevention rather than detection, and an emphasis on quality at the design stage. The customer-driven approach helps to prevent errors and achieve defect-free production. When problems do occur within the product development process, they are generally discovered and resolved before they can get to the next internal customer.
Fast response

To achieve customer satisfaction, the company has to respond rapidly to customer needs. This implies short product and service introduction cycles. These can be achieved with customer-driven and process-oriented product development because the resulting simplicity and efficiency greatly reduce the time involved. Simplicity is gained through concurrent product and process development. Efficiencies are realized from the elimination of non-value-adding effort such as re-design. The result is a dramatic improvement in the elapsed time from product concept to first shipment.

Actions based on facts

The statistical analysis of engineering and manufacturing facts is an important part of TQM. Facts and analysis provide the basis for planning, review and performance tracking, improvement of operations, and comparison of performance with competitors. The TQM approach is based on the use of objective data, and provides a rational rather than an emotional basis for decision making. The statistical approach to process management in both engineering and manufacturing recognizes that most problems are system-related, and are not caused by particular employees. In practice, data is collected and put in the hands of the people who are in the best position to analyze it and then take the appropriate action to reduce costs and prevent non-conformance. Usually these people are not managers but workers in the process. If the right information is not available, then the analysis, whether it be of shop floor data, or engineering test results, can't take place, errors can't be identified, and so errors can't be corrected.

Employee participation

A successful TQM environment requires a committed and well-trained work force that participates fully in quality improvement activities. Such participation is reinforced by reward and recognition systems which emphasize the achievement of quality objectives. On-going
education and training of all employees supports the drive for quality. Employees are encouraged to take more responsibility, communicate more effectively, act creatively, and innovate. As people behave the way they are measured and remunerated, TQM links remuneration to customer satisfaction metrics.

A TQM culture

It's not easy to introduce TQM. An open, cooperative culture has to be created by management. Employees have to be made to feel that they are responsible for customer satisfaction. They are not going to feel this if they are excluded from the development of visions, strategies, and plans. It's important they participate in these activities. They are unlikely to behave in a responsible way if they see management behaving irresponsibly - saying one thing and doing the opposite.

Product development in a TQM environment

Product development in a TQM environment is very different to product development in a non-TQM environment. Without a TQM approach, product development is usually carried on in a conflictual atmosphere where each department acts independently. Short-term results drive behavior so scrap, changes, work-arounds, waste, and rework are normal practice. Management focuses on supervising individuals, and fire-fighting is necessary and rewarded.

Product development in a TQM environment is customer-driven and focused on quality. Teams are process-oriented, and interact with their internal customers to deliver the required results. Management's focus is on controlling the overall process, and rewarding teamwork.