CHAPTER 2

EVOLUTION OF TQM

2.1 THE STORY OF TOTAL QUALITY MANAGEMENT

The Total Quality Management is a revolution in the thought process (Ishikawa, 1986). Rather than defining it needs to be understood better from its initial start. And understanding comes from the constant and committed practice of the concepts. It is a business philosophy that aims for the improvement of an organization’s result, including financial performance, of the management system. With this the objective of TQM is to ensure the long term survival of the organization with a clear cut focus on the customer.

The word ‘Philosophy’ has created many a storm in the TQM research area.

TQM penetrated into American business and boardroom meetings in the late 1980s. America’s big corporations jumped into the implementation process of TQM the moment they came to know about this through a TV program broadcasted featuring none other than Dr.Edward Deming. The entire American business came to know about the work of Dr.Deming in the rebirth of Japan’s industry through the commitment on Quality. And very truly these are the organizations in the USA losing their market to the Japanese onslaught competition (Thomas Powell, 1995). Everyone wanted to have Dr.Deming as their consultant and help them clear their organization like what he did to Japanese organization.

So when TQM caught the imagination of American business it has already been practiced very successfully in Japan. And here in the US, researchers started
to find out the meaning and the origin of TQM and went on to claim that the concepts of the TQM are American and started citing Henry Ford from his book “My Life and My work” and stated that Ford is the pioneer in TQM concepts (AR Martinez Lorente et al., 1998).

In his monumental work on Total Quality Control, Dr. Ishikawa highlights one interesting point. He says the Total Quality practiced by Japan is not the same as proposed by Dr. A V Feigenbaum (Ishikawa, 1985). This is a thought provoking statement. Does that mean there are two variants of TQM? Surely this needs to be analyzed in depth.

Is TQM a business philosophy or a set of tools and techniques?

A few points on what is a philosophy could guide us further into our journey.

Philosophy can be called as Reflective Science (George Fullerton, 1904).

The synthetic interpretation of facts, thoughts and senses can be called as philosophy. And this means and includes in a very grand way of studying the following five fields together.

1. Logic
2. Esthetics
3. Ethics
4. Politics and
5. Metaphysics (Will Durant, 1953)

Studying all the five together and synthesizing the facts together is called as philosophy whereas the first element, logic takes upper hand and tries to measure the TQM philosophy on TQM methods as success or failure.
In order to understand the TQM philosophies we need to go back in our time.

2.2 I THINK…THEREFORE I AM- RENE DESCARTES

The Aristotelian philosophy was ruling the world in the cosmic science. New thoughts started coming into existence and questioned the old methods. A new branch of science is emerging. The work of Nicholus Copernicus and Kepler brought down the old concepts of Earth as the centre of the Universe and new science is emerging. The ideas that were ruling the world started crumbling down. And the time is so ripe for new thinking, new concepts and new philosophy. This started the Renaissance in Europe.

It was Descartes who proposed the idea that the universe is a machine and went on to put his point that human body is also a mechanism (Emerson Thomas McMullen, 2002). With the publication of “The Principles of Philosophy” in 1644 Rene Descartes took an important position as a man who is instrumental in shaping the new thought process of the generations to come.

Descartes aimed at reconstructing the minds in such a way so that it reaches the true and definitive answers in the natural law. This reconstruction proposed two new methods. The first being the historical and involving the mathematical experimental way and the second being integration of the mind and body (Mario Laserna, 1997). His inspiring words “I Think Therefore I am” is simply the manifestation of the integration of mind and body.

Another most important contribution by Descartes is his Cartesian geometry and this made possible for the future mathematical inventions to come.

He inspired more and more individuals to seek the truth and he is rightly positioned as the most important figure in the modern philosophical
discourse. And the world is getting ready to receive another greatest mind. He single handedly changed the course of scientific enquiry into new horizon. And indeed he declared once “If I could see further than Descartes, then it is by standing on the shoulders of such giants” (Corliss Lamont, 1997). It was Sir. Isaac Newton.

2.3 SIR ISAAC NEWTON-FATHER OF SCIENTIFIC ENQUIRY

“Nature and Nature’s laws, lay hid in night:
God said, Let Newton be! and all was light.

Alexander Pope

Such was the praise for the man who is responsible for shaping the thought process of so many generations and instilling the scientific enquiry into the minds of people.

Newton considered Descartes as his predecessor and he started his seminal work. But he did not fully subscribe the views of Descartes and he moved away from his theological concept to his own experimental philosophy which is dense with a lot of mathematical principles.

He presented his grand work “Principia- the Mathematical Principles of Natural Philosophy” as a rejoinder to Descartes’ “The Principles of Philosophy”. Newton succeeded in separating Technical Physics that has a strong foundation on mathematical models from metaphysics. Newton focused his attention on the mathematical analysis of motion and the forces causing it (Andrew Janiak, 1985).

The new science developed by Newton can be easily understood by reduction principle. To put it in other way a whole system can be better understood by reducing it to a very small level and then finding out how these
small units react with others. Equilibrium and controlling mechanism are the two fundamental concepts in the Newtonian philosophy (Dooley K et al, 1995).

Newton’s followers applied his concept of experimentation in controlled atmosphere method in almost all field and great many inventions took place because of that.

And what will happen if these physical laws with mathematics at the core applied to social systems?

Gradually the social systems were also changing

The world moved into another movement kick started by one Steam Engine and further took the lead in textile sector in England.

The Industrial Revolution era started.

Industrial revolution created the factory system and the writings of the great men created a social upheaval and freed men from their bondage. 19th century management concepts were all stating that success depends entirely on getting the initiative of the workmen and it was really a rare case this initiative is achieved. (F W Taylor, 1911)

2.4 F.W. TAYLOR, HENRI FAYOL AND MAX WEBER

F W Taylor and his Scientific Management principles have become a way of life for the industrial set up and a very dominant force still in use and should we say that the legacy of Taylor is a force to reckon with.

FW Taylor declared in his scientific management that the initiative of workmen is obtained with absolute uniformity. And managers assume the burden of gathering all traditional knowledge which in the past has been possessed by
the workmen and then clarifying, tabulating and then reducing it by rules, laws and formulae.

In the whole process Taylor grouped the new duties of management into four heads:

1. Develop a science for each and every element of a man’s work and this will replace the old rule of thumb
2. Scientifically select and train, teach and develop the workmen where as is the past worker chooses his own work and trained himself
3. Heartily cooperate with the men so that the work being done in accordance with the science developed.
4. There is almost equal division of work and responsibility between worker and management

Today’s management concepts are greatly influenced by reductionism principles built on Newtonian concept. Whatever concepts preached, practiced and discussed in industrial set up today are all steeped in the Newtonian concept generalized in the 18th century and propagated, promulgated in 19th century.

Division of labor, idea of work, interchangeable parts, time and motion study is some of the concepts still ruling the industries.

The most important element in modern scientific management is the task idea. The work of every workman is fully planned out by the management and every workman receives complete written instructions describing in detail the task which he has to accomplish as well as the means to be used in doing the work.
Drucker viewed Taylor at the same rank with Freud, Darwin and Marx in his influence on the modern world.

Disciples of Taylor did the same thing what the followers of Newton did to Newton. Taylor’s concepts were applied to the entire possible industry spectrum.

There were five original objectives of the scientific management:

1. Industrial process can be reduced to units for scientific observation and experiments. The operations of workmen can be reduced to fundamental motion to ascertain the longest, shortest and average time required for each motion.
2. The standard time prescribed for each operation can be used as the task for each workman to achieve. Each unit of product can be produced at a designated standard and at a standard cost.
3. The workmen can be instructed in the best methods for achieving the standards and the responsibility for imparting such instructions should be in the hands of foreman.
4. The workmen can be relieved of the responsibility for determining how a process is to be performed.
5. The workmen can be inspired to accept new methods.

When we look at the above objective and the content described in the scientific management we can find and understand how the entire Newtonian concept played such a vital role in the industrial management and thereby making management into science.

By stressing the concept of cooperation FW Taylor tried to put a full stop on the individualistic approach that was dominant in the entire 19th century. He was the first man to initiate the quest for better performance
at work. Taylor was the first management thinker to stress the concept of research and standards in management. It was he who emphasized the importance of planning and more importantly the concept of control. His focus was on workers and how to manage work. Most of his scientific management concepts are still followed in HR function (Sultan Kermally, 2001).

At the time of its introduction Scientific Management was very controversial. Taylor received a lot of criticisms and oppositions from workers’ side as he called for the methodical and scientific investigation of their each and every activity. Workers thought that this would help the management to exploit them. And at the same time management was happy to know about the work and workers movement. With the help of scientific management, efficiency of the workers improved drastically and now management knows the control mechanism in its process (Michael G Freeman, 1996). But on its part management is not interested in sharing the prosperity with the worker. Taylor’s focus was improving the efficiency of the work man and interestingly he quoted President Roosevelt call on improving national efficiency.

Scientific Management has brought in a drastic change in the entire approach towards the management and its responsibilities. The impact was felt in the entire area of industrial management. In fact with his scientific management Taylor tried to change the role of workers and tried to improve their contributions to the organization and also ensuring that they also move up in the ladder. But he couldn’t convince his principle during his life time. Taylor was the first to stress the role of research and use of standards and emphasized the concept of planning and the control in management.

While the contributions made by Taylor looked into the worker side of the organization another man proposed and developed many principles for management upon which even today’s management concepts are built. He was Henri Fayol. While Taylor suggested that management must take the
responsibility of running the organization, Fayol provided the much needed principles, concepts and even he defined the functions of management.

In the year 1900, March 23, a lecture was delivered by Henri Fayol on the closing session of International Mining and Metallurgical Congress in Paris. For the first time industrial people had the opportunity to hear about the aspects of management. Later Fayol developed all his thoughts shared in this Congress into a full fledged administrative theory (Daniel A. Wren, 2002)

Thus Fayol’s writings precede that of F W Taylor.

While Taylor concentrated on task management, Fayol spent his time thinking on the higher level of management.

He pointed out that management was an activity common to all human undertaking and argued management concepts are universalistic.

He divided the industrial activities into six groups namely, Technical, Commercial, Financial, Security, Accounting and Managerial. It was Fayol who provided us the functions of management, Planning, Organizing, Command, Co-ordination and control functions.

Fayol credited the turnaround of the company, Comambault, after he became the CEO to his administrative theories. He pointed out that he did not depend on his technical skill but his ability as an organizer and his skill in handling men. (Daniel A. Wren, 2001)

Fayol tried to make his principles as flexible as possible so that they become universalistic and approved by the entire set of organization.

While Taylor was claiming that his Scientific Management is the Panacea for all ills of an industrial organization Fayol invokes intelligence,
decision making and the experience to the situation are the vital links in solving management problems (Lee D. Parker, 2005)

Are Fayol’s 14 principles still valid in today’s hyper competition market scenario? It is very important to note Principle 12 and 13 and their stated and implicit meaning here now. While principle 12 talks about tenure of personnel for the longevity of the organization principle 13 talks about Initiative from the managerial level. Here Fayol stresses the importance of hierarchical set up but today’s dynamism allows each and every employee to take the initiative and less and less hierarchical set up. And Fayol is still very much relevant with his principles but with a modification in the framework approach in the implementation side (Carl A Rodrigues, 2001)

Taylor’s Scientific Management and Fayol’s General Administrative theory supplement each other and provide more elaborate input matter in dealing the ills of industrial organizations.

It will be an interesting point to note the comparison between Taylor and Fayol in the following few lines.

1. Taylor called his philosophy as “Scientific Management” while Fayol described his approach as “General Theory of Administration”.
2. Taylor looked at management from the lower level i.e., from the workman and supervisory level and tried to improve efficiency. And he further elaborated his theory moving upward while Fayol viewed management from the top and moving downwards for coordination.
3. Taylor’s concentration was on the shop floor and improving the shop floor activities while Fayol provided a framework for the managers to effectively handle the organizations.
4. Taylor provided techniques for the shop floor management while Fayol delivered the functions of management.
The next important personality in developing the classical theory of industrial organization is Max Weber whose contributions of Bureaucratic theory put the stress on the hierarchical way of working and abiding rules and regulations.

It is interesting to note some of the features of the bureaucratic model developed by Weber:

1. A well defined hierarchy with clearly defined authority and control
2. Very high degree of specialization of work
3. Division of work based on function.
4. Impersonality of relationships among employees.

The negative aspect of this model is that it breeds mechanistic way in the organizations and restricting the creative thinking of the employees. And in turn this will encourage resistance to change. Despite the criticism this model has imbibed into the soul and heart of even today’s organizations.
These three towering personalities are fit to be called the Triumvirate of the Classical Theory of Industrial organization. And it will be very difficult to wash away their contributions but at the same time it is very much essential to understand the positive and negative aspect of this and try to overcome the negative aspects.

The classical organization is mechanical in nature and we can see this by the following special features:

1. Classical Organizations are built around accounting model.
2. The workman is considered basically an economic man-he works for money- and can be motivated maximum through monetary aspects.
3. Concept of organization is basically physical rather than mental.
4. Hence the concept of job design and suiting person to that work profile entered.
5. The relationship between worker and management is through highly formal. It is exemplified in the rules and regulations, formal communication and clearly defined task and its associated accountability.
6. Stability of the employee means very little or almost no change between employees and their work departments.
7. The corner stone of classical organization is their centralized authority and control.

And classical organizations suffer from the following ills:

1. Classical theorists assumed organizations as a closed system and they are isolated. But organizations do interact with the environment
2. Classical theory based organizations based upon a strict and rigid hierarchical structure which lay importance on position and authority.
3. With inputs from bureaucratic model organizations restricted employees with adherence on rules and regulation. This has further put a curb on the creativity of the employee.

4. They believe that man can be motivated through money.

5. Most importantly they don’t believe in informal organization within organization.

The Scientific Management focused on worker and Fayol’s management process approach focused on functions of managers and in between the human relations method concentrated on the worker-manager relationship. And while all these three concepts are at war with each other a new school of thought emerged. And that is called General System concept. This approach focuses on the organization as a whole, its internal and external components, the work process, the people in the organization and most importantly the environment in which the organization is operating.

2.5 HENRI FORD—A MAVERICK GENIUS

The “One World” concept was fueled by the machines that are driven from the crude oil extracts. And the most important event in the 20th century was making these machines in numbers and energizing the economy.

Historian Allan Nevins quoted, “No other single machine, in all probability, did so much to induce people of provincial mind to begin thinking in national terms; none did so much to knit together different parts of the country” (Carl Solberg, 1976). Automobiles symbolized and embodiment of these changes. By tradition the mounted transport, horse driven carriages were meant for the socially high class people and they would like to show off their fast horses and their wealth in the public avenues. When these horseless carriages started coming on the road the general mood was that they will be owned by the rich and will be made as an alternate for the mounted carriages.
And the early manufacturers were doing the same. But one man decided just opposite. He said he will build cars that costs less and he announced his cars are for masses.

It was Henri Ford.

Ford sold his first car for $1200 and kept on working to bring down the cost. His master stroke was his moving conveyor assembly line. And with that Ford has created the automobile production system (T. Ohno, 2002).

In these moving conveyor assembly line basic inputs materials were brought and they were all processed at a specific sequence with the help of special tools to produce one standard product in large quantities (Paul Milogram and John Roberts, 1990). Ford started his famous Model T on this line and kept on producing black colored cars. His ultimate aim of producing cars for the masses accomplished.

Ford brought the Scientific Management concepts into a reality. The highlights are simple, interchangeable parts are assembled with special tools at a specific sequence of a repeated same operation by deskilled operators. Taylor with his time and motion study concepts decomposed the task and assigned the workers whereas Ford had recomposed the task into individual worker and then forming them a great human machine (Simon Clarke, 1990).

With his technical advancements Ford eliminated the craft model of worker and brought in a new class- semi and unskilled workers. Since the task is decomposed to its minutest level and simple and special tools were used and one had to do a repeated operation. Slowly gradually Taylorism is changed into Fordism. The traditional method of controlling the worker in craft production was through the payment of piece-rates along with supervision achieved through skilled workers, on the basis of internal
sub-contracting and the gang or helper systems. Taylorism involved the rigorous individualization of the piece-rate as the means of monitoring and regulating the effort of every worker. And Ford differed in this and thought and implemented necessary changes. He brought in the control based on a combination of the technical subordination of the worker to the machine, enforced by external supervision and reinforced by new methods of encouraging the worker's subjective motivation. And the motivation he thought was the monetary motivation. And Ford came up with his 5 Dollar per day pay.

Did everything move smoothly for Ford?

He had his own problems. The labor problem started creeping in.

The dramatic changes in the production technology had its own pitfalls. And this changed the life of worker for ever. It became a question of do it or quit. Ford made man a machine. In the year 1913 Ford had to hire 50448 men to maintain his average requirement of 13623. This is 370% and Ford asked his personnel head to look into the issues. The following are the extracts from that report:

1. Long working hours.
2. Low wages. When a man feels he is underpaid then he started looking for a change.
3. The way the workers are handled by foremen and superintends.

The Ford Motor Company announced a new policy on January 5, 1914. In that the working hours were brought down to 8 hours from 9 hours and daily wages were increased from $ 2.34 to $ 5 and this increase was said to be efficiency wage (Daniel M.G Raff, Lawrence H Summers 1987).
With Ford Motor Company putting up plants in many countries the basic concept of Fordism propagated.

And Ford stopped his Model –T in the year 1928. Also the Human Relations concept started getting into management ideas. Elton Mayo is the leading light in this concept.

2.6 ELTON MAYO-THE HUMAN RELATIONS SCHOOL

The effect of mechanization on human being happened in a speed that was never imagined. Many people rose against this and many put forward their feelings and suggestions. We can demand efficiency from a machine but how to tackle the issue of pure mechanical efficiency from human beings. Even people went to say that America is sacrificing the aspect of her civilization for material progress (Mayo, 1930)

The year was 1924. Place was Western Electric’s Hawthorne plant. One initiative was started to understand about the lighting effects in the organization. National Research Council started a set of experiments in this plant trying to find out a simple answer whether better lighting enhance productivity? One of the longest periods of experiments conducted. Elton Mayo was the leading figure in these experiments.

The results of these studies had a profound impact on the social science. Each and every time when something is changed worker productivity increased and when the researcher tried to bring the initial old condition even that time also productivity increased. This spurred the interest and imagination of the researchers and these experiments were carried out for next 8 years.

This has given a new thrust in the management of organization, a radical new thinking opposite to that of Fredrik Taylor. Attention to the
employees is the key in enhancing the productivity was the answer and this led to the new dimension of study Industrial Psychology (Steven D Levitt, John A List, 2009).

With this the organizational management theory divided into two and ran opposite to each other. One is the Scientific Management by Taylor and other being the Human relations school led by Elton Mayo.

Since these were originally started analyzing the effect of lighting impact on productivity these were called The Great Illumination. The following few points derived from the Hawthorne studies.

1. Organizations have human element.
2. Workers develop informal groups within the organization.
3. Worker morale and quality of supervision intertwined.
4. Informal groups exert more power than the formal groups.
5. Informal groups can influence the behavior of the members.

This discovery of informal groups later became Team and Team Building. In this context Mayo is far ahead in his thinking. And also a frontrunner in stressing that social skills are more important in managing people than the technical skills.

With these concepts emerging more and more and the study into industrial psychology took a definite step into our organizations. Ford’s foreign initiatives were not very positive and slowly Fordism starts decaying and the Human relations theory became a serious and valuable one for organization.

2.7 WALTER A. SHEWHART- FATHER OF SQC

The year 1924 saw the start of two of the most important concepts in managerial thinking. And the birth place was Western Electric. In May that
year Walter Shewhart described his first control chart which launched statistical process control and quality improvement. In November began a series of research projects which came to be known as the Hawthorne studies. The findings from these Hawthorne studies later became the central point in fields of the sociology, social psychology, and anthropology of the work place. Although these events occurred at the same place and in the same year, there has been remarkably little cross fertilization of ideas between them. While at Hawthorne, Shewhart influenced W Edwards Deming who went on to champion Shewhart's methods. Joseph Juran also worked at Hawthorne from 1924 to 1941 and was influenced by Shewhart. Shewhart, Deming, and Juran are often considered to be the three founders of the quality improvement movement. Two of Shewhart's contributions continue to influence the daily work of quality—namely, control charts and the Plan–Do–Study–Act (PDSA) cycle.

The focus on reducing variation as a way to improve quality is a non-obvious contribution of quality management.

Dr. Shewhart worked hard to provide a sound philosophical idea for quality and at the same time trying to device a working method for managing the day to day working on quality and quality control. Shewhart identified two categories of variation which he called “assignable-cause” and “chance-cause” variation. Others call the two categories “special-cause” and “common-cause” variation, respectively. He devised the control chart as a tool for distinguishing between the two. The various control charts that Shewhart proposed were for variables and attributes. Shewhart reported that bringing a process into a state of statistical control—where there is only chance-cause (common-cause) variation—and keeping it in control was needed to reduce waste and improve quality. Shewhart is referred to as the “father of statistical quality control”. Shewhart's historical memorandum of
16 May 1924 proposed the use of the statistical control chart to his supervisors. In the preface to his book “Economic Control of Quality of Manufactured Product” Shewhart stated:

The object of industry is to set up economic ways of satisfying human wants and in so doing to reduce everything possible to routines requiring a minimum amount of human effort. Through the use of the scientific method, extended to take account of modern statistical concepts, it has been found possible to set up limits within which the results of routine efforts must lie if they are to be economical. Deviations in the results of a routine process outside such limits indicate that the routine has broken down and will no longer be economical until the cause of trouble is removed.

His book was a master piece and in the first publication itself he gave a detailed presentation on the working of the tools and techniques to be adopted in the quality control (P. C.Mahalanobis, 1948)

Thus he gave a new dimension to the Industrial organization and its management. First time one voice was heard speaking about the customer and customer focus. In fact he definitely stressed that organizations exists only to serve customers.

By 1933 the Great Depression had reduced the Hawthorne work force to 6000. Shewhart's work received worldwide attention but no appreciable change took place at Hawthorne. By the time Juran left in 1941, he observed that the priorities assigned to the production departments were to meet schedules and achieve high productivity. Quality was left to the inspection department.

The events at Hawthorne in 1924 changed the way managers see the world of work. Drawing on the Hawthorne studies and Shewart's statistical
process control, the concepts of organizational behavior remain mostly unsynthesized, unmerged idea streams. The former have become the academic domain of social sciences and organizational behavior and the latter became engineering and production management concept. The former group of academics did not use mathematics with the enthusiasm that engineers did. These academic departmental boxes have delayed the synthesis of these ideas. This synthesis can happen in the workplace by making the understanding of variation and its causes. We pay attention to what we can and do measure. The choice of measures needs to be customer focused. Simply paying attention to the employee can create a Hawthorne effect. Creating a joyful transformation of the work environment may help align the goals of management in the formal organization with the informal organization of the workers.

Then the Great War started. World War II took this world by storm.

Having entered into war America started to correct its manufacturing machines in order. And also its weakness in Quality control and Inspection needed to be addressed. For the first time specifications and standards were created and people were trained in these standards and techniques in mass. There were so many 5-days, 10-days and 16-days intensive courses conducted on quality control.

Roosevelt Administration invited Ford Motor Company to produce parts for its fighter planes, Willow Run. Mr. Charles Sorensen, Vice-President-Manufacturing, Ford motor Company was given the charge of the new plant to be put and with his experience. 8800 nos of Bomber produced in that shortest time and that made all the changes for America. Finally America did the magic of pulling the victory towards its side and an unprepared army finally put its acts together in a successful way. The dying Fordian principles were given a new lease of life with this and we still wonder whether America learnt any lesson.
After the bombing of Hiroshima and Nagasaki, Japan surrendered and accepted its defeat in the World war. US Occupation of Japan started officially from Sep 2, 1945 and went upto April 28, 1952. General Douglas MacArthur, Supreme Commander of Allied Powers was made the military Governor and his main responsibility was to restructure and revamp in full scale of the corporate and financial systems of Japan (Randall Morck, Masao Nakamura, 2005)

W.Edwards Deming, statistician and a consultant on sampling technique was invited to Japan by Supreme Command of Allied Powers in the year 1947 for census work. And again Deming was invited in 1950 by Union of Japanese Scientists and Engineers (JUSE) to introduce Statistical Quality Control to the business people in Japan.

2.8 DEMING, JURAN AND ISHIKAWA

While sharing his thoughts on Japan about what happened in Japan in 1950, Deming stressed one important point that the planned visit should not be a repeat mistake of what happened in America during the war time. And he further added that the top management must understand its responsibilities (Edward Deming, 1986).

What happened to the concepts of Taylor, Fayol and Weber?
What went wrong in their teaching?
Has Taylorism lost its value to Fordism?

Deming was worried on how to reach the top management and this was accomplished by Mr. Ichiri Ishikawa, the then President of JUSE. He insisted that the business leaders should attend the meeting. And finally on July 1950 nearly 21 top men from the Japanese industries attended the conference.

For the first time Deming advised the top management to view production as a system and he used a simple sketch on the board which had a
greater bearing in all the further meeting and points discussed. In this conference he stressed that customer is the most important part in the production line. The world comes to know the concept of customer focus.

Deming started his discussion to the assembled top management team by stating that he is not going to give a sermon on statistics or statistical techniques. In an earnest way Deming told them that he wanted to say something about the manufacturing and its problems. Very politely he agreed that he is not an expert in manufacturing, neither an economist and nor a miracle worker. He went on to add that he could understand the problem of manufacturing through his statistical work and had worked with the people. Hence he told them to view production as a system and he drew a simple diagram and this diagram became a regular one in all the further classes. The opening of any session started with this diagram and thus he made a very strong impact on the minds of the top team that system view was the most important aspect of management.

![Fig 2.2 System approach for manufacturing](image)

He stressed that product quality and uniformity are very important factors for the management. And he demanded that leaders show the way in this by demonstrating enthusiasm so that the factory people strive for improvements. While stressing for product quality Deming also emphasized on market survey. Deming gave a beautiful definition of what is called an economic way of producing and the most useful way. The product quality was equated with economic way of producing and the most useful way was
equated with market survey. He contended that product quality and market survey would surely create a market for Japanese product world over. He said that improvement in quality will create a chain reaction.

![Chain Reaction Diagram](image)

**Fig. 2.3 Chain Reaction**

He addressed the top management team after his first lecture on statistical quality to the engineers and technicians. And in the opening note itself he declared that a new economic era was created with the usage of statistical principles and techniques (Peter J. Kolesar, 1994). The famous PDCA cycle method which was originally developed by Shewhart was explained by Deming and thereafter it was called Deming Wheel in Japan.

![PDCA Cycle Diagram](image)

**Fig 2.4 PDCA Cycle**
Deming clearly compares the commitment shown by the US top management team and the enthusiasm shown by Japanese counterparts. On seeing this enthusiasm and the demonstration of commitment by them Deming was satisfied and said a new era dawned for Japanese industries based on the quality and its improvement.

Deming’s 14 points for Management

1. Create constancy of purpose toward improvement and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and to take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company.
9. Breakdown the barriers between departments. People in research, design, sales and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the workforce asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the workforce.

11. Eliminate work standards (quotas) on the factory floor, Substitute leadership.

12a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibilities of supervision must be changed from sheer numbers to quality.

12b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, abolishment of the annual or merit rating and of management by objective.

13. Institute a vigorous program of education and self improvement.

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody’s job.

Deadly Diseases

1. Lack of constancy of purpose to plan product and service that will have a market and keep the company in business and provide jobs.

2. Emphasis on short term profits: short term thinking (just the opposite from constancy of purpose to stay in business), fed by fear of unfriendly takeover and to push from bankers and owners for dividends.

3. Evaluation of performance, merit rating or annual review.

4. Mobility of management; job hopping

5. Management by use only of visible figures with little or no no consideration of figures that are unknown or unknowable.

6. Excessive medical costs.
7. Excessive costs of liability, swelled by lawyers that work on contingency fees (Deming, 1986).

Deming finally synthesised all his concepts – Quality, Statistics and variations coming out of both system and human- and condensed into his famous Theory of Profound Knowledge (Stephen B. Knouse, Paula P. Garson, Kerry D. Carson and Ronal B. Heady, 2009).

2.9 DEMING’S SYSTEM OF PROFOUND KNOWLEDGE

What Deming calls profound knowledge is knowledge universal to all businesses, large or small, in service or manufacturing, profit making or not—for-profit. The prevailing style of management must undergo transformation. A system cannot understand itself. The transformation requires a view from outside. It is needed to provide an outside view, which is called a system of profound knowledge. It provides a map of theory by which to understand the organizations that we work in.

The first step is transformation of the individual. This transformation is discontinuous. It comes from understanding of the system of profound knowledge. The individual, transformed, will perceive new meaning to his life, to events, to numbers, to interactions between people. Once the individual understands the system of profound knowledge, he will apply its principles in every kind of relationship with other people. He will have a basis for judgment of his own decisions and for transformation of the organizations that he belongs to. The individual, once transformed, will:

- Set an example
- Be a good listener, but will not compromise
- Continually teach other people
- Help people to pull away from their current practice and beliefs and move into the new philosophy without a feeling of guilt about the past
The layout of profound knowledge appears here in four parts, all related to each other:

- Appreciation for a system
- Knowledge about variation
- Theory of knowledge
- Psychology

One need not be eminent in any part nor in all four parts in order to understand it and to apply it. The 14 points for management in industry, education, and government follow naturally as application of this outside knowledge, for transformation from the present style of Western management to one of optimization.

The various segments of the system of profound knowledge proposed here cannot be separated. They interact with each other. Thus, knowledge of psychology is incomplete without knowledge of variation.

The purpose of the organization is to serve the customer and Deming’s profound knowledge is the basic foundation for the total system and his 14 points are the implementation guidelines of the philosophy of customer delight (Harper A. Rohem, Joseph F Castellano, 1997).

Dr. Joseph Juran was invited to Japan in 1954. Japanese industries were at the peak of using statistical methods and at this point of time they need help to take their quality movement forward (Ishikawa, 1986). Juan’s invitation to Japan by JUSE was the direct reaction to his master class work, “Quality Control Handbook”.

Dr. Juran joined in Western Electric in 1924 and slowly moved up in his career. In 1941 he took the position of Industrial Engineer. After the war he moved out of Western Electric and started his own practice of consulting.
Dr. Juran emphasised on the management leadership in quality improvements and concepts of defect prevention and process improvements are well ahead of his time. He further modified the PDCA cycle for process improvements (Peter J. Kolesar, 2008)

![Fig. 2.5 Quality Trilogy](image)

Fig. 2.5 Quality Trilogy

<table>
<thead>
<tr>
<th>Juran Trilogy</th>
<th>Quality planning</th>
<th>Quality control</th>
<th>Quality improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish quality</td>
<td>Evaluate actual</td>
<td>Prove the need</td>
<td></td>
</tr>
<tr>
<td>goals</td>
<td>performance</td>
<td>Establish the infrastructure</td>
<td></td>
</tr>
<tr>
<td>Identify who the</td>
<td>Compare actual</td>
<td>Identify the improvement projects</td>
<td></td>
</tr>
<tr>
<td>customers are</td>
<td>performance with</td>
<td>Establish project teams</td>
<td></td>
</tr>
<tr>
<td>Determine the needs</td>
<td>quality goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of the customers</td>
<td>Act on the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>features that</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>respond to customer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>needs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop processes</td>
<td></td>
<td></td>
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<tr>
<td>able to produce the</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>product features</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish process</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>controls; transfer</td>
<td></td>
<td></td>
<td></td>
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<td>the plans to the</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>operating forces</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 2.6 Quality Trilogy I
The contributions of Dr. Juran to quality movement are immense and he was very polite in his stature. Bringing human dimension into quality was the most important achievement of Juran. He made a point on managing quality and advised top management to be quality minded always.

In his own words Dr. Juran compares himself with Dr. Deming in their work, ‘Deming and I agreed on most fundamentals. We both were crusaders of good quality. We agreed quality problems had their origins in the system, not the worker. We deplored the efforts to solve problems by means of colourful banners and slogans, we were aware the leadership in quality must come from the top management’ (Debbie Phillips-Donaldson, 2004)

Japanese business leaders continue to learn new things and started to apply them in their domain. In this process many quality gurus came up and one such man was Kaoru Ishikawa.

Ishikawa’s association with quality started very early in his career. He observed Deming and worked with Juran in their lectures. His contribution
to quality is his famous Fish Bone diagram or Cause and Effect diagram used as a quality tool. And he will be remembered for his role in democratizing quality.

He finally introduced Quality Control Circle in Japanese industries with workers voluntary participation.

![Fig 2.8 Cause and Effect Diagram](https://via.placeholder.com/150)

In our attempt to understand the central point of our thesis, Total Quality Management, so far we have gone through the vital concepts that govern the basic concept. As we explore further we will discuss the practical application concepts as we encounter.

### 2.10 THE MOVEMENT CALLED QUALITY

The word Total Quality Control was first pronounced by A V Feigenbaum in his monumental work titled in the same way. He defined TQC as an effective system for integrating the quality development, quality maintenance and quality improvement efforts of the various groups in organizations as to enable production and service at the most economical levels which allow for customer satisfaction. And he thought and made TQC as a specialist activity and put under QC specialists.
And this definition itself is very misleading and the root of all the problems (Jens J. Dahlgaard, Kai Kristensen and Gopal K. Kanji, 2005). To succeed new management thinking like TQC requires a paradigm shift in the thinking.

Deming and Juran were fed up with such system in US after the War ended. In fact Juran left Western Electric saying that he failed in big corporations. That is one of the reason Deming thought that the mistake happened in US should not be repeated in Japan when he was invited for a series of lectures for JUSE. And the message should go to the top management and they should understand their responsibilities. Without the enthusiastic participation from top management the new concept will surely fail and JUSE organised for a meeting of some of the top management people with Dr.Deming and the breakthrough came in the meeting at Mt.Hakone and they understood that the organization should be viewed as a system and the important responsibility of management is to improve the entire system.

We understood from our tracing of the movement Deming brought the top management into the day to day managing of the organization and Juran taught the middle level people on managing quality with his brilliant Quality Trilogy concepts and finally Ishikawa took the movement to the operating level people with his Quality Control Circle where the participation is voluntary.

In contrast Taylor`s focus was on workers and Fayol talked for top management and Weber brought in a structure. And nowhere the responsibility of management was defined.

Dr.Deming clearly defines the responsibilities of management in his famous 14 principles. It was widely criticized that Deming did not specify any methods to implement TQM and in fact he never used the term TQM. And he
categorically stated that improvement of quality is a method but no one can give a ready recipe like a cook book (Edwards Deming, 1986). The effort put by the top management in understanding the 14 principles would provide a recipe on how to handle his organization’s problem. It is not enough that one masters the theory but also apply and improve it.

The onslaught of Japanese auto maker’s competition in US drove the US corporations to follow what they were doing. But as Ishikawa pointed out that QC begins with education and ends with education the failure will be attributed to their inability to learn their responsibilities.

The major difference between American and Japanese interpretations of TQM is that Japanese learnt to work to improve the whole system by involving everyone in the organization and US corporations still believe that quality activities should be dealt with the specialist like Quality department only. They still rely on Taylor method on reductionism whereas Japanese worked on integrating the entire organization.

Table 2.1: Differences between TQM practices in Japan and Western

<table>
<thead>
<tr>
<th>SI No</th>
<th>TQM practised in Western</th>
<th>TQM practised in Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Specialist orientation. Quality is QC department’s responsibility</td>
<td>Quality is everyone’s business and everyone is responsible</td>
</tr>
<tr>
<td>2</td>
<td>Reductionism based</td>
<td>Integrative approach</td>
</tr>
<tr>
<td>3</td>
<td>Top down approach</td>
<td>Participation by all</td>
</tr>
<tr>
<td>4</td>
<td>Problem solving approach</td>
<td>Overall system improvement</td>
</tr>
<tr>
<td>5</td>
<td>Hence mechanistic view</td>
<td>Organic view</td>
</tr>
</tbody>
</table>

USA and Western Europe organizations are still influenced by Taylor concepts.
Taylor died of pneumonia in the year 1915 just four years after the publication of his monumental work but Taylor is still living on. Such is the impact of his concepts.

When Dr. Deming was invited to Japan he was determined that the mistakes happened in the USA should not be repeated and hence he asked for a meeting with the top management. With the support and the participation by the top management of Japanese organization Deming started his experiments in Japan in full scale. And the Quality movement is born. He simply elevated Quality as a competitive and sustainability parameter. With his famous chain reaction concept he took Quality into strategic management concept. Along with such concepts a much greater change in the shop floor level took place. Few job classification and very limited work rules in the shop floor but production is basically organized as team work. Since the team is responsible for the completion of job lower level workers took up the responsibility and a new era of worker participation, empowerment and motivation through work ignited into the organizations. Work progressed steadily, smoothly and sequentially from team to team. Functional specialisation and discrete jobs were no longer flexing their muscles for the organizations to thrive (Martin Kenny and Richard Florida, 1989). These characteristics encourage shop floor learning. Workers participation not only increased improved productivity and quality but also had an impact on their social life. They felt that they are also a part of the organization and worker absenteeism decreased drastically.

Team work and managing team became the voice of the organization. Many little brains sharing the information and working together made the organization flexible and more focused on meeting the customer needs.

Deming’s chain reaction concept started with a simple yet powerful statement- “Improve Quality”- swept the heart and mind of the top management team. And he demanded from them that it is their responsibility
to ensure that the down the line operating people believe what they say so that participation is happening. And they ensured his words were kept. And from that point onwards the entire organization had only one goal- Quality.

And thus Quality became the focal point of an organization. Also the narrow definition of Quality has moved to a broader concept. They also understood and learnt that the customer defines Quality and hence it will not remain a static one and will always be a dynamic one and hence continuous improvement of quality is the only answer.

While addressing the top management Deming informed them that the journey would be a long and hard one and advised them to look into the future, think and work for the future.

Modern Quality control concept came into being with the publication of the monumental work by Dr. Walter Shewhart “The Economic control of the manufactured products”. Aptly he called this method as economic control of quality. In the first publication itself he provided the detailed insight into this new concept discussing both the philosophical foundations and the working methodology also.

To achieve competitive edge high quality with low cost is a must. This is possible only by learning about the process. Learning about the process means understanding the dynamic nature of the process and the inbuilt variation that comes along with the process. Manufacturing process is considered as a continuous and self correcting method for the optimized utilization of raw materials (George E P Box and Soren Bisgaard, 1987).

2.11 TQM- IMPLEMENTATION & FAILURES

Implementation of TQM requires a new level of understanding and creating an environment in which everyone in the organization understands and
delivers their best. As pointed out by Deming it is very dangerous to do things without knowing completely what it means (Edwards Deming, 1986). More importantly implementation does not mean and stop with creating the initial conditions. Failure in implementation should not be considered as a failure if it produces negative results but failure in follow through (Jonas Hansson, 2003).

Implementation of TQM calls for drastic changes to be done at the organization and a major shift in the thinking and attitude of the managers towards work. The expected change in the attitude of managers is across board. This is a very big task and very difficult to measure. Failing in this could fail the entire TQM program. The senior manager’s attitude of “Do what I say and not what I do” confuses the worker level and also restrain the commitment from their side (Michael Beer, 2003). The basic foundation for a successful TQM implementation invokes on how to manage the organizational changes and also sustaining them in the dynamic market conditions (Iyer, Ananth V, and Seshadri, Sridhar, 2005)

There are many models available for the introduction/implementation of TQM. They may be generally divided into the following three types:

1. Implementation approach based on Consultants’ idea
2. Implementation approach based on Awards
3. Implementation approach based on Academician (Monica Sharma & Rambabu Kodali, 2008)

And nowadays ISO certification is also viewed as an instrument in TQM implementation.

The teachings and the methodologies of Edwards Deming, Joseph Juran and Kouru Ishikawa are considered here for the basic consultants’ based approaches.
Though there are many quality related awards available the TQM implementation approach generally takes the following awards

1. Deming application prize- The most detail oriented step by step methodology for the implementation
2. MBNQ Award- Instituted by the Government of the USA for the promotion of TQM. It accesses the implementation program with the following guideline figure. Basically divided into two- Enablers and Results

![MBNQA Model](image1)

**Fig 2.9 MBNQA Model**

3. EFQM model

![EFQM Model](image2)

**Fig 2.10 EFQM Model**
With so much of research into TQM many academicians have developed few models and the following are important in their approach.

1. Kanji Model

![Kanji Model](image1.png)

**Fig 2.11 Kanji Model**

2. Prof. Oakland model

![Oakland Model](image2.png)

**Fig 2.12 Oakland Model**

And a very generic model is also presented here for the understanding purpose.
3. Dale model

![Diagram of Dale model]

**Fig 2.13 Generic model proposed By Dale**

The many organizations now consider implementing ISO 9000 system is a way of implementing TQM and our argument is against this concept.

1. ISO 9000 is built on the basis of inspection
2. It encourages command and control. The basic assumption of these standards are work is best controlled by specifying and controlling the procedure (Tumoki Shimada and Nobuki Okamoto, 2009)
3. The standards promote sub optimization.

It is indeed going many miles far away from the teachings of Dr. Deming (Abell, David A, 1992)

According to Robert Grant organizations need to reorient or transform themselves to take up TQM because it directly challenges the existing management theories and practice (Robert Grant et al, 1994).
When implemented properly TQM programs are bound to give the necessary thrust and life to the organization. It is the inconsistency that makes the TQM initiative a failure (Gary Salegna and Farzaneh Fazel, 2000). The success or failure is the result of top management understands on TQM and its actions on TQM (T.Thiagarajan and M.Zairi, 1997). It is very important for top management to understand the constituents of barriers that hinder the effective TQM implementation (Nabil Tamimi and Rose Sebastianelli, 1998).

Another reason for failure is the confusion between the objective of TQM and its methods used. Many organizations consider using the methods is implementing TQM (Joseph N.Kelada, 1997).

Further research suggests that the failures are the result of starting the TQM without planning/thinking and most importantly copying tools and methods without understanding their own process (Alloway, 1994).
Not involving employees and empowering them to have a say on the decision in the regular life in the organization was another reason for the proposed failure of TQM implementation (Sohail Anwar, 1997)

Introducing TQM in an organization and implementing the concepts is a major change initiative and hence it is quite natural that there will be forces that oppose the implementation program (Tigineh Mersha, 1997). So implementation simply means follow through in each and every stage. This follow through process by the top management shows their commitment and going beyond the commitment they show they are participating. When TQM is perceived to be a failure it was suggested that the reasons were not that of problem in the TQM philosophy but the implementation process was not properly planned. And any major change initiative will take time to take its root and TQM is no different in that and this strong rooting will considerably influence the behaviour, attitude and the value systems of the employees in a better positive way (A.Ghobadian and D.Gallear, 2001). And the single most important point in organizational change is that adequate importance is to be given to the employee involvement and assessing their needs and the aspirations to change. If this is not done then the initiative for change will be a failure (Ziaul Huq, 2005). It is very clear from this the perspective is on the people’s side and managing their change attributes.

So much research has been conducted on TQM and so many implementation issues been discussed. But invariably almost all the researchers agree on the following three CSFs.

1. Customer focus
2. Team working and
3. Continuous improvement
TQM is not an add-on to the organizations existing way of managing. It is totally a new outlook and requires new level of thinking and working together concept.