# QUALITY MANAGEMENT AND PLANNING

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### ABSTRACT

*In the last century, during the production era, "quantity" of products was essential. Later on, the competition in the world markets taught that "cost" was very important: "Less the cost, sell more". Then somehow somebody produced goods that had minimum cost but the highest level of standards: even going beyond the expectations of the customers. Then the "quality" era was started.*

*In this paper, it is aimed at, to evaluate and to connect past and present of the quality concept which is one of the essential subjects of the world in the second half of the twentieth century.*

*-Why quality became so much important?*

*-Where did it come from?*

*-How quality implementation can be assessed?*

*-How can we make a connection to the subject of environmental quality, urban life quality, etc.?*

## INTRODUCTION

Perhaps quality needs for the goods and services started with the beginning of history. Human being has always needed high-quality goods and services, and still, the roots and driving forces are the same, the quality understanding and the process itself has undergone many changes:

- The customers themselves checked the quality of the product.
- A group of craftsmen checked the quality, (lonca-inTurkey)
- The geographical site gave a quality mark to the product, (silk of Bursa).
- Samples had a role for the quality check.
- Customers' representatives played the role of quality controller

At present, some of these methods are still applied and used throughout the industrial, commercial and also environmental quality control. When the industry formed in the shape of small workshops in Europe, there the craftsmen who produced the stuff were responsible for the quality of the goods. After the Industrial Revolution, the small workshops disappeared, and large factories were established, and also the quality control mechanism has been changed. In large industrial firms, departments were responsible for the quality of their products, goods and services. They also created their specifications, technical drawings, standards in written form, for testing the proof of quality.

## HISTORICAL ROOTS OF THE QUALITY

The historical roots of the modern quality control methods have been reached to industrial revolution decade led by Ford Company of U.S, production of cars ¡n serial form. When the craftsmanship was ended, the planning and production processes were split up, and as a result, the number of production/quantity has been increased while the quality of production has been decreased. Then it was noticed that to check the products' quality before going to the dealer, was fundamental matter, and a special central division must have done an inspection and quality control. In this way, although the subject has been given to the hands of people whose principal job was the responsibility of quality, the upper management still gave more attention to the production volume than the quality of goods.

With the twentieth century, the industrial organizations and service organizations grew, their tasks became more complicated, and the quality departments continue their growth. Jobs within the quality departments started to diversify- such as quality engineering, test engineering, reliability engineering, measurement and standards engineering, safety engineering, statistical process control engineering, audit department, etc.

The modern history of quality is marked by significant advances between 1920 and the 1950s by George Edwards, Walter Shewhart, W. Edwards Deming, Armand Feigenbaum, and Joseph Juran (1).

The history of QUALITY is a very interesting story, not only has taken the stage in Japan but rather roots have gone to the U.S. At Ben Laboratories in the 1920s, Walter A. Shewhart developed a system known as statistical process control (SPC). He also created the Plan-Do-Check-Act (PDCA) cycle, which has been applied to the scientific methods to improve the way we work. PDCA is a cycle; by repeating the cycle on a work process, which causes higher levels of performance and also called continuous improvement.
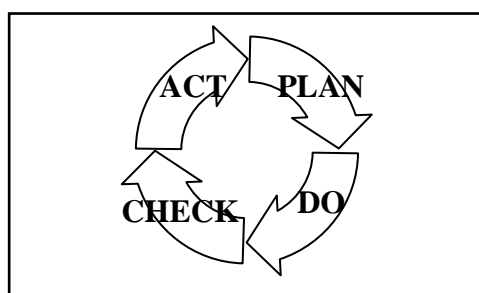


**Figure.1** *Plan-Do-Check-Act Cyle(2)*

The U.S. War Department took Shewhart's SPC methods seriously during World War II (2) and employed Shewhart's student, W. Edwards Deming, a mathematical physicist and U.S. Department of Agriculture and Census Bureau researcher. He taught, SPC to the defense industry because quality control and statistical methods were very important critical elements in the war that they were classified as military secrets as "Z-1" in the United States and "Standards 600" in Britain. After the war, most American companies stopped using SPC.

In the 1950s and 1960s, it was only used by quality control departments (2). The reason was being clearly due to the post-war conditions in the world. After the war, the industry in the U.S. was the only industry still working in full capacity since the industry of Europe and Japan were dropped to almost zero. The world was in urgent need of materials and machines to recover and to rebuild their cities and industries. The only source was Americans, and they worked full capacity during the war, enlarged their premises, spent as a lot to research and development, and they were on track. This led American's to give full attention to the production and meeting the quantity goals, which led to an increase in quality problems (2).

After the war, the U.S. helped the Japanese to form the foundations of modern industry by applying quality control methods, including SPC. This was used in the first hand by the electronics and communications industry. The results impressed many Japanese, including the Japanese Union of Scientists and Engineers (JUSE). It is now the most prestigious quality organization in Japan. Then the occupation forces invited W. Edwards Deming in 1950 to Japan second time. The JUSE asked him to lecture business leaders on SPC and quality control. Japanese industry was suffering from poor quality goods, and they were trying to export their goods to world markets in those days. Deming told them if they apply his philosophy and techniques of quality control, they may become the best country producing quality goods. They took him seriously and today "Made in Japan" is a worldwide accepted quality mark, and every year, quality awards are given in Japan in the name of Deming (3).

Another American expert, Joseph M. Juran, helped to Japanese, expanded the methods to all functions in an organization. Armand V. Feigenbaum taught Japanese the need to involve all departments in a company for quality. He called this philosophy "Total Quality Control" which is still used in the same understanding (8).

Later Japanese began to study Abraham H. Maslow: "The Hierarchy of Needs" and David N. McGregor: "Theory Y". Basing his work partly on Theory Y, Ishikawa helped to create "Quality Circles". These were small teams of managers, workers, and supervisors trained in SPC, PDCA, and group problem-solving. "Quality Circles Teams" at every level of an organization started using SPC and POCA in their daily work. Still interesting those" Quality Circles" later tried to be applied in U.S. and Europe but they did not succeed remarkably.

During the 70s and 80s foreign competition was a threat to U.S. companies. The threat was from Japan. Japanese electronic products and cars flooded the U.S. with low cost, premium quality and fit for use. Still, American companies were proud of their after-sale service networks and quick repair in these shops; they claimed Japanese products have expensive spare parts. The reality was; Japanese products usually do not need service since they do not malfunction in regular use during their entire life.

When the sources in strong competition of Japanese companies were investigated by U.S. companies; it is found out that the main reason is the quality understanding and implementation in the Japanese industry (8). The responses of U.S. companies were paying more attention to quality control. W. Edwards Deming, Joseph Juran and Armand

Feigenbaum were remembered American Companies re-discovered the quality and their leaders who were Americans. However, American companies were still in difficulties to understand the messages of Deming, Juran and others (2).

John A. Betti, the undersecretary of defence, was an executive at Ford Motor Company. He recalls (2):

> *"I distinctly remember some of Dr Deming's first visits to Ford. We wanted to talk to him about quality, improvement tools, and what programs would work. He wanted to talk to us about management, culture change, and senior management's vision for the company. It took time for us to understand the profound cultural transformation he was proposing. "*

Many private and public sector organizations in the USA tried to introduce the improvement tools and use in the organization, but most of these attempts failed. For example, the "American Quality Circles Movement" had reached its peak between 1980 and 1985. It almost died because management forced it to employees. SPC was in the picture but failed everywhere. The reason was that management did not lead employees to take corrective measures using the information produced by SPC. Organizations tried to apply zero defects concept as a motivational tool for workers rather than a management performance standard. Used numerical targets like in management by objectives, without giving the necessary resources, and then found that the result was only slogans, which demoralized people more and more. This period can be called the demoralization period in quality except for Japan (8).

About 1985 and on, people began to understand Deming and what he meant by "Continuous Improvement". Quality management is not only a set of techniques; which produce automatic results. Many organizations still did not understand this. It is a way of doing business, way of life in the organization. Many companies failed in the implementation of TQM because management did not behave in the way they should, but instead, they wanted employees to obey the rules. They did not want any change in management but wanted employees to change their working habits towards quality purposes (8).

According to Dr H. J. Harrington (3):

> *"The obvious is sometimes so difficult to see. As early as 1950. We realized that 80 per cent of business problems could not be corrected by management. In the mid- the 1980s, a new concept emerged. It is something that we should have realized 30 years ago. When we were talking about management being responsible for 80 per cent of the problems, somehow we missed the true meaning of that realization. "*

From Total Quality perspective, what needs to be done is to prevent problems; where it is not preventing problems from occurring again, but it is preventing problems from occurring at first.

In the Foreword of Mary Walton's book (4) 'The Deming Management Method' written by W. Edwards Deming, the situation in the U.S. on quality matters in 1986:

*"Why is the Western industry on the decline? Why has the balance of trade of the United States of America deteriorated year by year for twenty years? The deficit in the export of manufactured goods is worse than the overall figures indicate, as export of agricultural products has been on the increase. We have people; we have natural resources, experience. Why the decline?*

*The biggest problem that most any company in the Western world faces is not its competitors, nor the Japanese. The biggest problems are self-inflicted, created right at home by management that is, of course, in the competitive world of today." (Washington, March 10 1986)*

## WHAT IS QUALITY?

Before going deep into today's quality topics, lit is important to look at the definitions of "Quality":

According to J. M. Juran (5): Quality is "fitness for use", and again for Juran, quality has two crucial meanings, and it is also used two different ways (6):

Product Performance: Product satisfaction point of view and,

Freedom from Deficiencies: Product dissatisfaction point of view

|  | Product performance | Freedom from deficiencies |
|---|---|---|
| **Needs for use** | Right features | Manufactured right |
| **Customer view** | Satisfied | Dissatisfied |
| **Effects** | Income | Costs |
| **Higher quality costs** | More | Less |

Here note that product satisfaction and dissatisfaction are not opposites. Product satisfaction is why customers buy the product, and product dissatisfaction is why they complain.

As we entered the 1990s, customers and stockholders were not looking for good quality, but they wanted perfection. This was a new, more demanding environment, with a new type of customer as Bert Stonier, chairman of Westinghouse Broadcasting Company, put it:

- **Quality** is doing the job right every time.
- **Perfection** is doing the right job right every time.

According to Howard Gitlow and Associates (1) from University of Miami, Quality is a judgments by customer or user of a product or service which also encompasses the never-ending improvement of a firm's extended process such as the internal processes along with those associated with customers, suppliers, investors, employees, and the community.

Three types of quality are integral to the improvement of the extended process:

- **Design/redesign,**
- **Conformance,**
- **Performance**

According to Carr and Littman (2); top management, responsible for the never-ending improvement of quality, must understand these three types of quality, the relationship between quality and productivity, and the benefits of improving quality. The quality environment of an organization is critical and stresses teamwork and communication.

## QUALITY MANAGEMENT

Deming's 14 points for management (7) provide a guide to creating and establishing the quality environment through behavioural change and using statistical methods to continually improve the process.

### Deming's 14 Points for Quality Management (7)

1. Create constancy of purpose toward improvement of product and service with a plan to become competitive, stay in business, and provide jobs.

2. Adopt the new philosophy. In a new economic age, nobody can live with commonly accepted levels of delays, mistakes, defective materials, and defective workmanship.

3. Cease dependence on mass inspection. Require, instead, statistical evidence that quality is built in to eliminate the need for inspection on a mass basis.

4. End the practice of awarding business based on the price tag. Instead, depend on meaningful measures of quality, along with the price. Move toward a single supplier for any one item, based on a long-term relationship of loyalty and trust.

5. Improve continually and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

6. Institute modern methods of training.

7. Institute modern methods of supervision.

8. Drive out fear so that everyone may work effectively for the company.

9. Break down organizational barriers-everyone must work as a team to foresee and solve problems.

10. Eliminate arbitrary numerical goals, posters, and slogans for the workforce, which seeks new levels of productivity without providing methods.

11. Eliminate work standards and numerical quotas.

12. Remove barriers that rob employees of their pride of workmanship.

13. Institute a vigorous program of education and training.

14. Create a structure which will push the prior 13 points every day.

Throughout the 1980s, most companies focused their significant efforts on correcting and improving their production processes. Only now is management realizing that it has been working on the wrong part of the business: The production process.

The result was a new improvement strategy called business process improvement:

- Improved reliability of their business processes.

- Improved response time.

- Decreased cost.

- Reduced inventories.

- Improved manufacturability

- Increased market share.

- Improved customer satisfaction.

- Increased employee morale.

- Increased profits.

- Reduced bureaucracy.

"Customers" are all persons who are impacted by our processes and our products. This word is used today both for real and legal persons like organizations and companies, and it includes both external and internal customers, including the government, society and the environment. Process improvement has turned into "Continuous Improvement". Since an organization starts changing, there is no use of stopping the change and improvement. Therefore continuous change and improvement became the essence of Quality Management (TQM). An organization can buy know-how and new technology but cannot buy continuous improvement, which comes from the employees.

## STRATEGIC QUALITY PLANNING

PDCA cycle starts with planning. In developing a strategy and plans, most organizations traditionally take into account financial, technology, marketing and operational components. Quality must also become an integrated part of the Strategic Quality Plans (9). The Traditional and Strategic Quality Plans are the following forms (9):
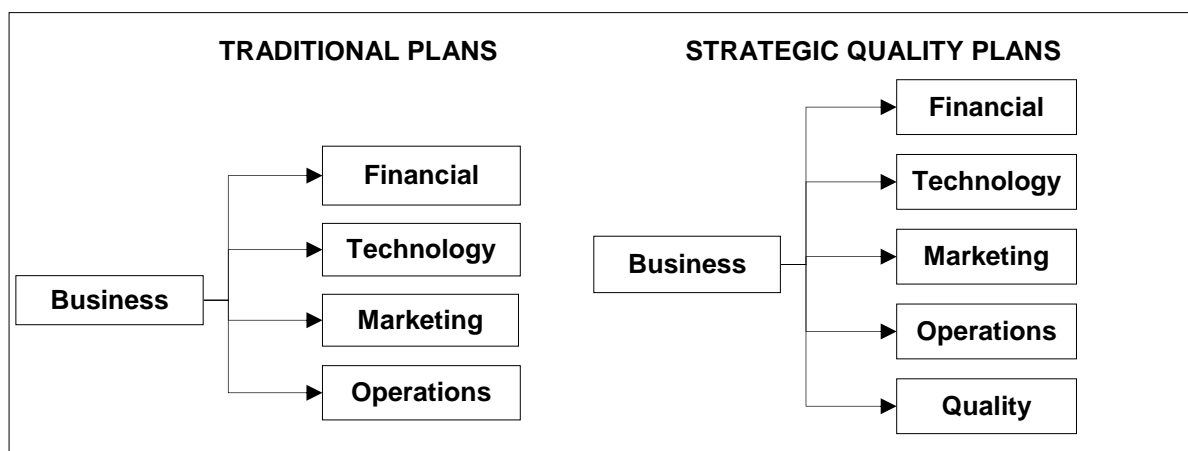


**Figure.2** *Traditional Plan and Strategic Quality Plan Scheme (9)*

Strategic Planning requires specific data: Assessment of the environment, identification of corporate strengths and weakness, identification of threats and opportunities in the external environment, identification of unique advantages, and identification of places that are vulnerable (9).

According to Juran's works, the planning phase should start with the contents of:

- **Vision,**
- **Mission**
- **Analysis,**
- **Strategy deployment plan,**
- **Expected results.**

**VISION**

Vision is the primary goal of an organization clearly showing where the organization wants to be in the future to be planned or what they want to achieve. It must be customer-focused, compelling, but achievable, shared in the organization and worth working for. Organizations take the state of the organization, the culture built into, the environment they are In, how the world Is changing, and the values of the owners or government into consideration to develop a vision (6, 10).

**MISSION**

The mission is generally defined by the establishers of an organization. It is the reason why we have that organization, what is the business it has to accomplish. Though changing technology and trade environment within time may affect the mission of organizations, e.g. (Turkish Post Office) is starting payments collection banking (6, 10).

In addition to Vision and Mission, Values and Quality Policies are also decided and communicated by different organizations:

**Values:** They are set of principles, types of behaviour and understanding which directs them in business and the borders for their understanding of a legal, ethical business and customer services and the actions or the way of thoughts which are unacceptable to the organization. These must be communicated thoroughly and must be accepted by all parties within the organization.

**Quality Policy:** Organizations develop a policy statement which is accepted by the owners or the higher management assuring the quality policy to customers while transferring their ideas on this matter to their employees within the organization thus forming a unique and same understanding spread overall levels of the organization.

## ANALYSIS

While starting planning, a detailed analysis has to be made ready. Since each plan is about the improvement to be achieved, and the present situation has to be known beforehand. Otherwise necessary measures cannot be put about the state that wanted to be achieved.

**Strengths, Weaknesses, Opportunities and Threats. (Swot Analysis):** Here, a widely accepted and relatively easy tool to use is Strengths, Weaknesses, Opportunities And Threats. (Swot Analysis).It can be prepared for the whole organization or subjects like technology, finance, marketing, etc. The vital aspect that has to be kept in mind that "Strengths and Weaknesses" are about the organization itself and "Opportunities and Threats" is about the environment of the organization. These must not be combined. However, this does not constitute the only model for the assessment, but other methods like statistics, focus groups etc. can also be used here (9).

## STRATEGY DEPLOYMENT PLAN

Strategy building starts from the vision. Each "Key Strategy" conforms to the vision statement, and they are essential for the organization to achieve its vision. Generally, they do not have to be measurable and may be open-ended statements (10).

These strategies can be divided into Strategic Goals that are numerical, measurable and very specific. The total Strategic Goals related to a strategy can form a whole strategy. The Strategic Goals can be sub-divided enough until reaching Annual Goals and Projects.
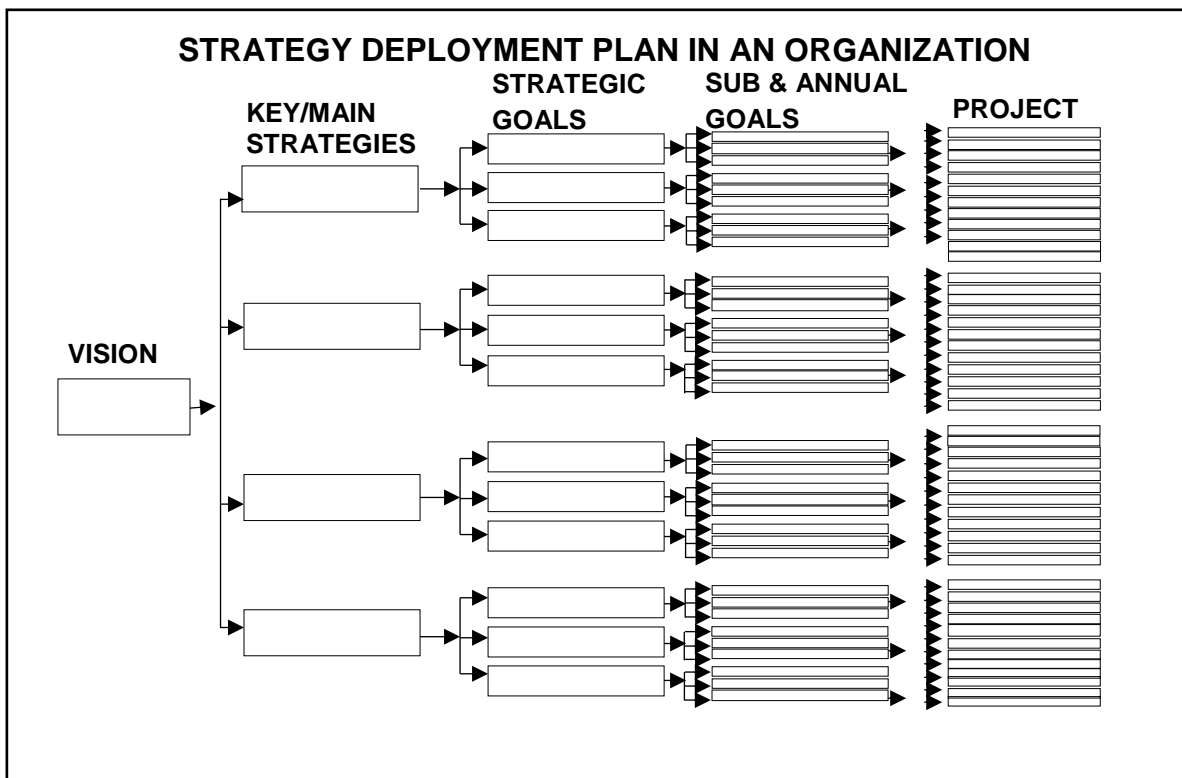


**Figure.3** *Strategy Deployment Plan in an Organization (W)*

Each Strategy and Strategic Goals must have been assigned a person with enough power that is responsible for that Item, generally called "Strategy Leader or Owner". Also for annual goals, generally division heads and for Projects Project Leaders or Managers Is responsible. Each goal or project must be specific, measurable, planned, and the results are observable and must be on solid grounds.

Strategic Plans are generally reviewed once every year, and necessary corrections are made. It is planned with a large group of people which can be gathered practically, and nearly all managers' contribution is taken into. It is communicated to all the employees for them to know the direction of the organization and act accordingly. All the efforts must be in the same direction with the vision, which is not generally achievable in the classical functional organizations.

## EXPECTED RESULTS

Plan-Do-Check-Act principle increases the quality level to ever reached levels. For companies and organizations later, a self-assessment model is developed. In the US it is called "Malcolm Baldridge Model of Excellence", in Europe it is "European Foundation for Quality Management" (EFQM) Model of Excellence. In Turkey, we have "KALDER" Model of Excellence. All these have the same basic structure.

Assessment of quality and models of excellence: there are awards given to different categories of companies, government and other organizations yearly and many of us must be heard about those; but the award is not the most crucial aspect here. The most critical fact lies under that; it is the self- assessment model. This model is a strong management tool and shows the direction of development to higher levels of excellence and forms a modern way of management of organizations towards a unique goal accepted by all the members of an organization. With this model, the present state of the organization can be measured with numerical means, the gap between our organization and competitors and the targets can be defined, and also necessary measures can be taken to decrease the gap (10). There are several studies which show the close correlation between the use of the EFQM model as a management tool and organizational development
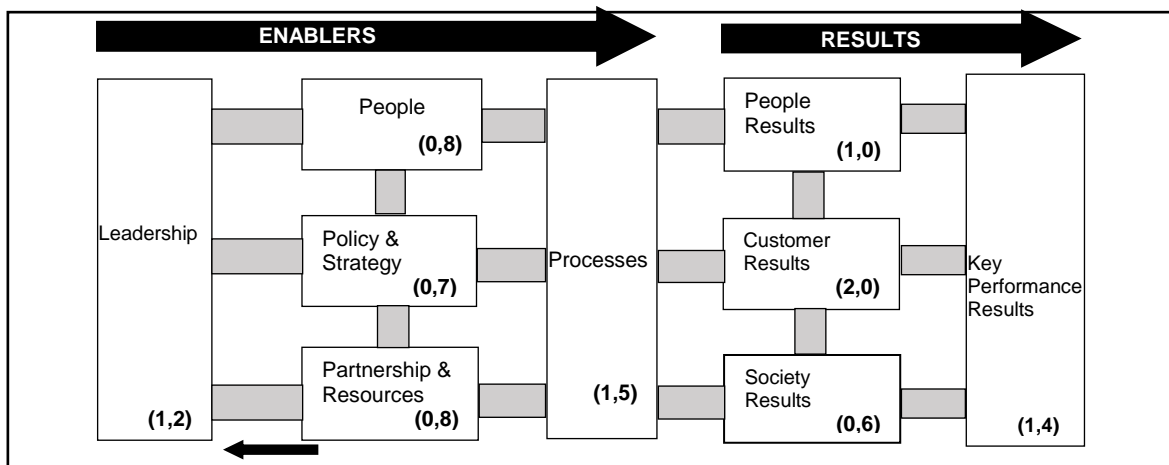


**Figure.4** *EFQM Excellence Model (10)*

The numbers in parenthesis show the relative importance or weight factor of the criteria.

Results of assessment are generally shown on a diagram called the "RADAR": (Result, Approach, Deployment, Assessment and Review)
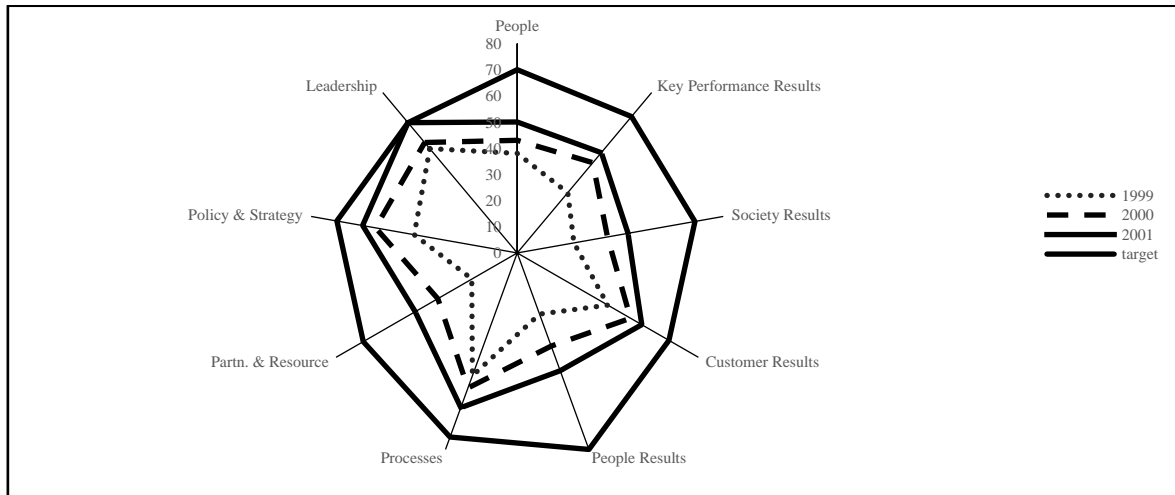


**Figure.5** *the Radar Assessment Diagram (10)*

In the diagram, it is possible to see quickly the levels of excellence reached year after year and the gap between the target and present condition.

The order of criteria is not essential, but still, weight factors indicate this order.

These weighting factors may change from year to year. Slightly more information given by EFQM on the criteria is below (10):

**Results Orientation:** Excellence is achieving results that delight all the organization's stakeholders.

**Customer Focus:** Excellence is creating sustainable customer value

**Leadership & Constancy of Purpose:** Excellence is visionary and inspirational leadership, coupled with the constancy of purpose.

**Management by Processes & Facts:** Excellence is managing the organization through a set of interdependent and interrelated systems, processes and facts.

**People Development & Involvement:** Excellence is maximizing the contribution of employees through their development and involvement.

**Continuous Learning, Innovation & Improvement:** Excellence is challenging the status quo and effecting change by using learning to create innovation and improvement opportunities.

**Partnership Development:** Excellence is developing and maintaining value-adding partnerships.

**Corporate Social Responsibility:** Excellence is exceeding the minimum regulatory framework in which the organization operates and to strive to understand and respond to the expectations of its stakeholders in society.

## CONCLUSION

In this paper about the quality, matters have been discussed in general, mostly related to companies or organizations. These matters are directly applicable to the quality of the environment and urban life. Starting from a single house up to the country, we can see the quality components there. The aim must be forming such an environment that surpasses the needs of citizens. To achieve this task, all responsible organizations: government, civil, technical, finance must work in the same direction without waiting for anybody to force them and must add the maximum amount of value to their tasks. All responsible authorities must not forget users and not put themselves in their place. Also, a person who is getting services from these authorities has tasks to perform. Citizens must also take this serious, whether personally or by gathering in civil organizations, they must also add to their environment. In the end, they are working for themselves.

In this workshop, the detailed studies about the quality of the environment and urban life shall be presented. What I wanted to do is just to summarize and remember historical development and quality matters in general.

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