We are IntechOpen,
the world's leading publisher of
Open Access books
Built by scientists, for scientists

6,900
Open access books available

185,000
International authors and editors

200M
Downloads

154
Countries delivered to

Our authors are among the

TOP 1%
most cited scientists

12.2%
Contributors from top 500 universities

BOOK CITATION INDEX
CLARIVATE ANALYTICS
INDEXED

WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com

Competence Education and Training for Quality

Vidoje Moracanin

Additional information is available at the end of the chapter

1. Introduction

The world global changes that are in their character historic and far-reaching are experienced at the end of the twentieth century. The phenomenon of globalization of world economy and world market has done to radically alter notions of time and distance. The world is becoming global and transnational systems of production / services in conditions of high mobility of people and capital.

Each country tends to its products and services reach the market freely in other countries, so that the world and national markets are increasingly overwhelmed with a large and diverse number of goods and services [1]. Removing technical and other barriers to trade created more opportunities for consumers and clients over the world. However, the increased flow of goods and services, is now more than ever, a need for increased consumer protection and consumer services. This is achieved by quality, to protect and connect people around the world. So to confirm and strongly affirm the assertion that no ideology has failed or will fail to unite the world, is only to have quality. The concept of quality includes, at the same time, all areas of human activity: quality products, quality management, quality management (government) and quality of the life of the people.

In the modern business world, globalization of markets, the quality is extremely important instrument for achieving competitive advantage of organizations. Success of the business is now determined by the ability of organizations to respond to the demands set by the market, and improving the quality of the business becomes an imperative of contemporary market trends. Improving the quality of business is long-term goal of all organizations that seek business excellence and achieving world-class products and services. The process of continuous quality improvement is based on the improvement of knowledge and productivity of all employees in the organization of individuals, especially those who are responsible for the growth of productivity.

2. Term of quality

The basis of the modern terms of quality "quale" is a Latin word that means what, how is something or someone. Of course, in some earlier languages of Latin, there are terms that describe exactly what it was something. The definition of the universal cosmic phenomenon and, despite the differences, they all end in terms of talking about the same. Long ago the brilliant Aristotle (384-322. Years BC) wrote about the quality "as the difference between individuals" in "Metaphysics".

The scientific approach to management occurs at the beginning of last century, in parallel with the work of Frederick Winslow Taylor from 1856 to 1915 i Henri Fayol (1841-1925). However, management appears much earlier and may be said to be as old as civilization and as the oldest types of organizations. The idea of management by Claude George, author of one of the most popular books on the history of management thought (Claude S. George Jr. The History of Management Thought, Prentice Hall, Englewood Cliffs, New Jersey, 1968.), dates back to the Sumerian civilization (5000 BC). The Sumerians lived in Mesopotamia, the area of present-day Iraq and Iran. They were in the beginning in clans, and then slavery society.

They have developed a high culture that was based on developed agriculture. It is believed that they achieved it by the construction of irrigation systems. Among the first they developed form of written records on cuneiform clay tablets. Then, the construction of the pyramids in Egypt during the Old Empire (2700 - 2200 BC). It is considered that the construction of the Cheops pyramid was more than 20 years. All this had a plan to organize, coordinate, and so on. Significant written records date from the old Babylonian state (2200 - 1700 BC), and for the first time in its written law regulating moral issues and the quality of work. As the law 229: "If mason builds a house for a man, and does not make it hard enough, and if it fell and caused the death of the owner - builder will be executed." There are still some of the current principles of war of the Chinese military leaders from 600 BC When it comes to ancient China we must not bypass the philosopher Confucius (ca. 552-479 BC).

Also, the Bible can be found elements of the vision and leadership. In the works of thinkers from ancient Greece can be found many wise thoughts on management, primarily state and army. There are Ksenofant (480-355 BC), his best pupil Socrates (469-399 BC). Socrates thought that someone who is unable to lead his own business, will not be able to keep any state. We mentioned the genius of Aristotle, who first mentioned the concept of quality - quality, and some of his ideas, which he gave in his major work "Politics" are current today, such as the:

- Specialization of labor,
- Grouping of jobs in the work unit,
- Leadership ("Who never learned to listen - can not be a good commander"),
- Centralization / decentralization,
- Synergy ("The whole is naturally superior to parts")

Aristotle's genius is not only in terms of quality but also to its versatility and legacy, which on very conservative estimates exceed 20,000 pages. It's not just the work but the whole library. For this we highlight the wealth "Metaphysics," which, according to many authors, is considered a major offense. The origin of the term metaphysics, the author dares to formal explanation. The phrase following the merger of the metaphysics of words μετα τα φιςνκα and haplologijom - omitting τα syllable that is repeated. There are similar examples in our language, such as - water carrier. In the section "Metaphysics" as item number 14 the heading TERM OF QUALITY. Before we move on to consideration of this concept, one more note, which refers to the fact that you should know that all of Aristotle's writings are divided into published and unpublished. The latter group includes Metaphysics. This means, in its reading and study we often have to ask whether we are dealing with authentic texts of Aristotle, as they are entered in the unpublished writings of his lecture for a narrower circle of older students who at least add some words of the teacher.

"The notion of quality. Quality is called, in one sense, the difference substances: for example, a man is a living being of certain quality because it is a biped, the quality of horses that quadruped; circle is a figure whose quality is no angles, all these things show that difference to the quality of substance really. In this first sense of quality is said to be a difference of substance. In another sense the quality mathematical meaning of real things, in this sense, the numbers have a certain quality: they are, for example, made up numbers, not numbers that denote not one size, but those whose size and weight are their image (those are numbers that are the product of two factors and the numbers that are the product of three factors), quality is what lies in the importance, in addition to its quantity: in fact, the substance of each issue is what exists once, so, for example, two is not six or three times one number, but one time since six times one is six Quality is also called properties of substances that move, as heat and cold, and whole hiatus, weight and lightness, and the other to determine the species, according to which, when changed, and the body said to suffer a change. On the other hand, in the field of quality are virtue and vice, and in general good and evil.

The meanings of quality could be largely reduced to two, of which is one the main. The first quality is the difference in the substance of things, and the quality of the numbers is a part of it, because it is the difference between substances, but substances that either are not movable. or are taken as moving. The second meaning involves determining the motion being taken as such, the difference of motion. Virtue and vice are to some extent among these forms: namely, they show the difference of movement and acting according to which the creatures that move or suffer the act good or evil, in fact, what you can not move or act in this way is right and what you can move or work in one, the opposite way is bad. Good and evil are expressed in particularly the quality of living beings, and of those most in those who are endowed with free choice "[2].

Concerning this passage from Aristotle's "Metaphysics" of quality (14-term of quality), it can be concluded that the quality, in fact, the quality. I refer primarily on product quality - quality ingredients. In addition to product quality, it could be an analogy with what we "can

not move or act in this way is right and what you can not move or work in one, the opposite way is bad" and get to something that would be might recognize as the product of agreement and disagreement. Also, one could see traces of the procedures and codes of behavior through, for example, "Virtue and vice are to some extent among these forms (quality): namely, they show the difference of movement and acting according to which the creatures that move and act suffer good and evil." The presence of motion to describe the quality can be considered as a process.

In addition to the concept of quality (quality), Aristotle mentions the most important resource, which is knowledge and that in the first chapter of the same book (Metaphysics) on page 3: "All men are by nature tending to get to know, the proof is the joy caused by the experienced knowledge; namely, in spite of their benefits we like then the visual information more than any other. Because we appreciate the sight of all, so to speak, not just to be able to do, but even assuming that we do not want anything to do. The cause of this is that, of all our senses, sight is a sense by which we gain the most knowledge and discover a multitude of differences. " This is Aristotle's conception of knowledge when compared with today's is understanding of knowledge and with knowledge that the most acquired knowledge is visually, about 70%, it is not difficult to see his greatness. Here is one of today's understanding of knowledge:

"Knowledge that is formed as a world view or self-consciousness is expressed in the form of religion, philosophy, art, science, folk wisdom, that is in the form of conceptual and artistic consciousness. It occurs as an expression of individual and group consciousness and experience and has deep roots in the past. Knowledge has always been part of organizing society and its development. "[3]

Aristotle's genius in universal is reflected in the fact, which in a large scale could also serve as Catholic theologians type Aquinas and Islamic mystics to the Indian Ocean. There is still no universal definition of quality. To help understand the concept of quality, quality

experts answer what is the quality:

- *Quality is not what most people think it is.*
- *Quality is noting new, what the majority of employees in jobs of the quality have already known and has attempted (and failed) to improve it.*
- *Quality is not just quality of products and services.*
- *Quality is not a "commodity" that can be purchased at the market. "[4]*

Even the world of quality gurus have different definitions of quality. Guru means a respected teacher, spiritual leader, who in his field has not only made a great contribution and innovation, but also a large-scale revolution. People who have established themselves and profiled philosophical trends in quality, are the gurus of quality. Guru of quality, in addition to its basic meaning, means a person who, with their concept and approach to quality, significantly contributed characterizing a period of time.

Although all the quality gurus contributed significantly to the development and improvement of the quality we will name six of them: Edwards Deming, Joseph M. Juran, Ishikawa Kaoru, Genichi Taguchi, Armand Feigenbaum and Philip Crosby.

In addition to these quality gurus at this time without fail the name of Philip Kotler, who is the "Financial Times" in 2001. was ranked among the greatest management guru Peter Drucker by side. On several occasions he traveled throughout Europe, Asia and South America, holding consultations and lectures to many companies. Among his clients are some of the leading, global companies like IBM, Michelin, Bank of America, General Elrctrica and Motorola. He is the author of many papers and books, the most famous is the "Marketing Management", and now the current of his new book "Chaos Magick, management and marketing in turbulent times." According to Kotler, turbulence has two main effects. One vulnerability, for which the company must develop a defense shield. The other is an opportunity which should be used with a new model called the Control System of Chaos. This is an innovative model that minimizes the vulnerability and exploit opportunities, and thus creates a competitive advantage.

However, definitions of quality are given in international standards. The audit standards and improve the quality of definitions, ranging from ISO 8402:1986 (1994), Vocabulary ("set of characteristics that an entity has to satisfy all requests, and even anticipated the wishes and preferences of the customer") [5], then, ISO 9001:2000 , Fundamentals and vocabulary (3.1.1Quality degree to which a set of inherent characteristics (3.5.1) fulfills the requirements (3.1.2)). and ISO 9001:9005, Fundamentals and vocabulary[6]

2.1. Basic quality elements

The basic elements of quality are: metrology, standardization, accreditation, certification and market control. Historically quality developed in accordance with the development of society. Analogously, evolved, also the quality elements.

2.1.1. Metrology

Measure some size means to compare it with a known size - standard. The science of measurement is metrology. Metrology is not reserved only for science, that is, scholars, it is vital for all people. Primarily for their health, consumer protection, the trust of customers / users, and to complete development and economic success of nations. The first recorded mention of metrology in ancient Egypt, and to measure the length. In addition, measures of length in the Bible - Old Testament reference to the weights - the weight measures and volume measures. Measures of length are calculated according to the human body: the finger width (1.875 cm), width of palm (7.5 cm), inch (22.5 cm) - width of the hand when the fingers are spread, from tip of the thumb to the tip of the little finger and elbow (45 cm) - from elbow to tip of middle finger. Most of measure of length was the Egyptian reed thar had six cubits, or twelve inches, 36 palms or 144 fingers. Bushel were given the names of the vessels that they received a certain amount agreed, noting that measures the volume of

liquids and solids were different. For the liquid is 1 baht (22.9 liters) and ten times a homer, and the dry matter of a chief, five times a litek and 10 head of a homer ("ass load"). Measures for the mass of 1 tera (0.5 g), 10 times larger is 1 guard, 2 guard is a shekel, 50 shekels was a mine, mine 60 1 talant (30 kg).

Besides the scientific metrology, which deals with the organization, development and maintenance of standards, there are legal and industrial metrology categories. Legal Metrology deals with the accuracy of measuring instruments, and industrial metrology has to ensure proper application of them. For these reasons there must be a national organization for metrology, which is a regional member, for example, EUROMET - European Collaboration in Measurement Standards, and / or the World Organization for Metrology OIML.

The importance of metrology is described in the old motto of the old traders: The number and dimensions - my faith

2.1.2. Standardization

Activities aimed at determining the provisions for common and repeated use, in relation to actual or potential problems, are undertaken in order to achieve an optimal level of standardization of neatness. These activities are specifically related to the processes of formulating, issuing and implementation of standards. Standard is a document established by consensus and approved by a recognized body. Standards should be based on the consolidated results of science, technology and experience. Under by consensus in reaching the standards does not mean unanimity, but a general agreement characterized by the absence of categorical opposition to any substantial question of interested parties, made in the process which seeks to take into account the views of all stakeholders to harmonize all conflicting arguments. Depending on the degree of involvement, level of standardization and standards may be international, regional, national and local. However, standards can be made on other grounds, such as branch standards or standards of the company (internal), which can be applied in several countries. The importance of standardization, ie, the standard is to improve the benefits of processes, products and services for their purposes, prevention of barriers to trade and facilitating technological cooperation.

A prerequisite for the smooth trade and free flow of goods and services is the application of international standards. As defined by the WTO - World Trade Organization under the term "international standards" is ment the only standards that are developed on the basis of the international system of standards and conformity assessment, and that was obtained by consensus, voluntary and by the influence of the market. International Organization for Standardization's ISO-International Organization for Standardization, which in the foreword of its standards gives the way to prepare and adopt standard of: ISO (International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member). The work of preparing International Standards is carried out in ISO technical committees. Each member of ISO, when the interest in the subject of some of the technical

standards committee has the right to delegate representatives to the Committee. International organizations, governmental and non-governmental, in relation with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC - International Electrotechnical Commission) with respect to all matters of electrical standardization.

2.1.3. Accreditation

The term accreditation is relatively common in everyday speech, and depending on the area in question is given a different meanings. For example, in journalism, getting right to the reporting of an event or place. Accreditation occurs in diplomacy where the competent state authority entitles a person to represent his country in another country. Often occurs in foreign trade, banking, and in correspondence. As can be seen, these are different areas of human activity on different instruments, but basically they all have a common factor in establishing trust.

At this time of globalization when the world trade in a rising market and a growing number of goods and services, there is a question of establishing a mechanism of trust between the supplier or service provider and customer or service user. Each customer or user wants the goods or services you purchase or use to be safe. that is not to be harmful to his health and the environment, and to meet their needs and expectations. However, every individual is unable to satisfy itself of the quality of goods or services, a time to gain confidence. To achieve this, he used different documents. These documents may be certificates which provide various certification authorities, certificates of inspection by the quality control organizations or test reports issued by testing laboratories. Also, here raises the question of confidence in these documents. In most cases the customer-user is unable to directly verify the validity of the certification bodies, inspection bodies, testing and metrology laboratories, but also in his behalf, the work national accreditation bodies, which determine the competence of these organizations. Accreditation body of the organization, which defined competency issues the decision on accreditation or accreditation certificate.

Thus, accreditation is formal recognition that a national body for accreditation after the procedure, which was by all compliant to international standards, confirming that the organization is competent to perform the defined scope accreditation. All these organizations are engaged in conformity assessment activities. Compliance is fulfilling the acquirements.

Depending on which jobs and organizations are involved is given the accreditation for the appropriate type of accreditation, and the types of accreditation and the scope of accreditation. Depending on the type of accreditation, these organizations can begin the process of accreditation:

- Laboratory testing
- Laboratory calibration (metrology lab),
- Control of the organization,

- Certification body of process for products and services,
- Certification body for quality management system,
- Certification body for management systems and environmental
- The organization for the certification of persons performing conformity assessment activities.

The introduction of standards and technical regulations in almost all commercial and industrial areas, significantly increases the number of products / services, processes, personnel and systems that may be subject to conformity assessment. For these reasons, the range of accreditation by an accreditation body performs is very extensive and covers mainly the following areas:

- Acoustics
- Agriculture
- Fire fighting and anti-explosive devices
- Chemistry and chemical products
- Electronics, IT, radio and telecommunications
- Construction
- Elect
- Mechanical Engineering and Materials
- Protecting the environment
- Food and Food Security
- Energy
- Medicine and drugs
- Textiles, rubber, plastics and packaging
- Business and Environment
- Protective devices and equipment
- Tobacco and tobacco products
- The objects of general us
- Non-destructive Testing
- Waste

Accredited organizations with the national accreditation body, which manages the accreditation system, make the accreditation system of the country. National accreditation systems attempt to integrate with regional accreditation system, as well as international accreditation system. To accomplish this goal, the national accreditation body for the activities under its jurisdiction shall adopt and implement a document governing the criteria, rules and procedures in accordance with the general requirements of a series of harmonized standards EN 45000, adopted by the European Organization for Standardization (CEN) and the series of international standard series 17000, adopted by the International Organization for Standardization (ISO) in collaboration of the International Electro-technical Commission (IEC).

European Cooperation for Accreditation (EA), at its General Assembly in June, 2002. in Bucharest established the general principles concerning the status of politics and national

accreditation body. The adopted principles are binding for both existing members and new. Existing members of EA must agree with them, and new ones have to meet before accession. Principles of EA:

- The principle of national recognition. Each accreditation body can become a member of the EA, only if the country is recognized as a national body. .This means that from one country may be delegated only of single accreditation body.
- The principle of profitability. Given that in one state can be only one accreditation body and thus is in a monopolistic position in order to preserve the independence and impartiality, the accreditation body must remain non-profit organization.
- The principle of financial independence. Accreditation Body must be able to assume their responsibilities for the service it provides in its entirety without limitation.
- The principle of orientation towards the user. Accreditation body, regardless of ownership, should conduct their activities in such a manner as to ensure quality services that meet market needs conformity assessment. It must also be provided with the influence of all stakeholders at all stages of accreditation.
- Principle is not concerned assessment of compliance. Accreditation body can not deal with the assessment of compliance in the area in which accredits other.
- The principle of non-competitiveness. Should avoid applying any other national accreditation bodies, as they infringed upon the independence and credibility of the member countries. But do not exclude the possibility that a foreign accreditation body provides its services in the areas for which national accreditation body has not yet qualified, but in agreement with the local accreditation body.
- The principle of supremacy. The national accreditation body shall conduct its activities in such a way that accreditation remains the highest level of control of conformity assessment activities. Means that there should be no possibility that someone at the administrative or other proceedings reversing a decision it has reached the final as the national accreditation body.

The national accreditation body is competent to determine the competence of organizations that carry out conformity assessment and accreditation competent body established by the Commission on the mechanism of EA peer evaluation (peer assessment / evaluation). Accreditation bodies which have successfully passed the assessment become members of the EA and are eligible to sign the Multilateral Agreement on Mutual Recognition. In this way, certificates, certificates of inspection and test reports are recognized in the EA member states. This eliminates additional conformity assessment and obtain conditions for the unimpeded flow of products / services. In addition to multilateral agreements within the EA members are bilateral agreements with accreditation bodies, which are not members of the EA.

2.1.4. Certification

Certification is the process by which accredited organizations issuing documents (reports, certificates) of Conformity confirms that a particular process, product / service, quality

system and environmental protection system are in compliance with the requirements of relevant standards, technical and other regulations. In this way it allows the consumer, the customer / user reach compliance, safe, high quality and reliable products, processes and services. The link between accreditation and certification is shown in Scheme-1.
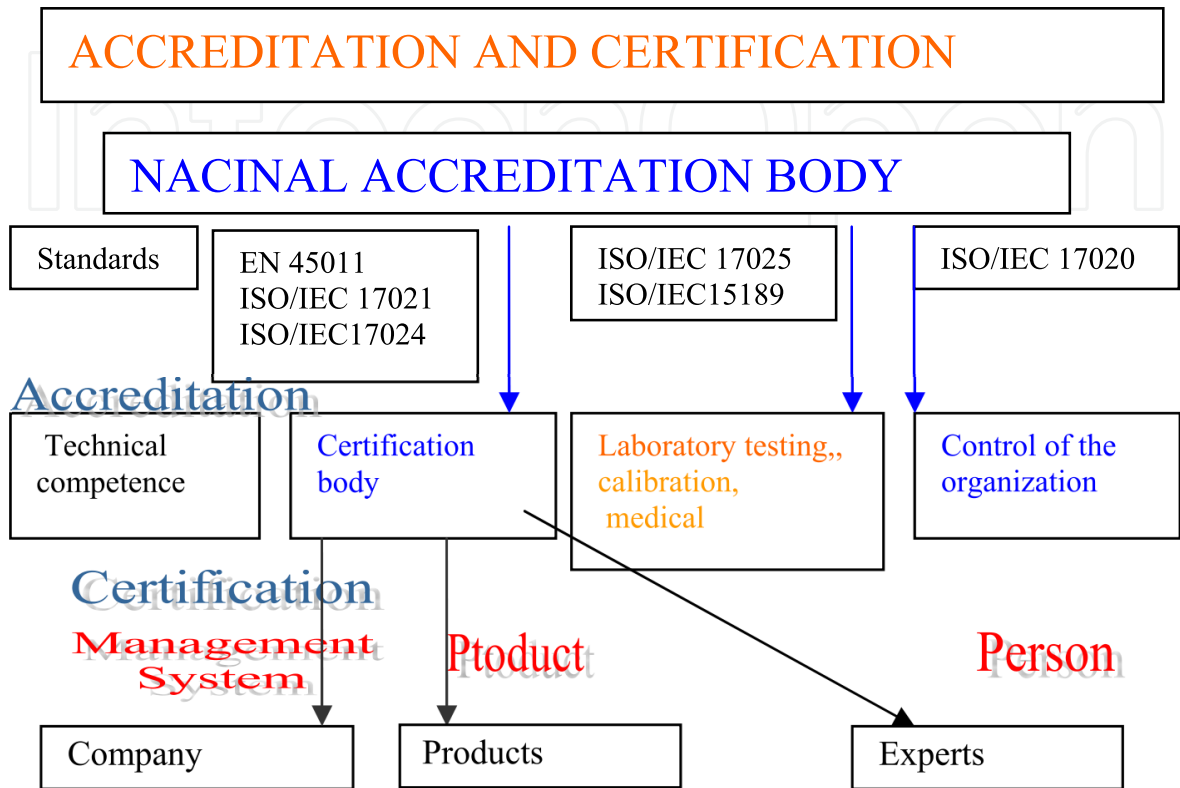

Figure 1. Schematic of accreditation and certification

Accreditation laboratories perform testing of food, environmental parameters, electrical devices of pressure equipment, chemical and textile products, human clinical samples, metals and metal products, animal feed, pesticides, seeds, construction materials and others.

Laboratories calibration performing calibration of measuring and test equipment.

Control bodies performing inspection of elevators and cranes, pressure equipment, electrical equipment and installation, quality furniture, quality of food and water, textile products, controlling the field of motor vehicles and others.

The organizations accredited by accreditation bodies get a sign-a symbol of accreditation that can be used in their reports, certificates and other documents in accordance with the Regulations on the use of accreditation symbol.

2.1.5. Control of market

Placing on the market is the initial activity that makes the product available for use or distribution. Products sold to the European Union should be harmonized with the relevant Directive, ie Directive. Existing EU rules guarantee free movement of products and high

level of protection for consumers and users with the basic principle that only safe products are placed on the market. Articles 28 and 29 of the EU Treaty on free movement of goods prohibits quantitative restrictions on imports, exports or goods in transit and all measures having effect equivalent to that of the Member States. These measures are not listed in the legislation, but are defined through the PRX is an important principle of mutual recognition:

"A product that is lawfully marketed in one Member State should be allowed the placing on the market of other Member States. Member States - the destination may be refused marketing is in its given form, unless it can show that it is completely necessary for protection, for example, public safety, health or the environment. In this case, the Member States - the destination must also show that its measure is such that at least restrain trade. " National legislation must be in accordance with this principle

2.2. Quality control world. A system of accreditation

Ensure quality control system in the world is shown in Figure-2. At the top is the WTO World Trade Organization (WTO), the International Accreditation Forum - IAF (International Accreditation Forum), and then follow the organization of regional and national level. There are four regional organizations for accreditation to the:

- EA-the European Cooperation for Accreditation
- RAS, Accreditation Asia, Australia and Canada
- IAAC, American accreditation
- SDCA, South African accreditation

At the national level, the national accreditation bodies that meet the general requirements of International Standard ISO / IEC Guide 61 earlier, i.e., ISO 17011, now and instructions EN, EA and IAF.
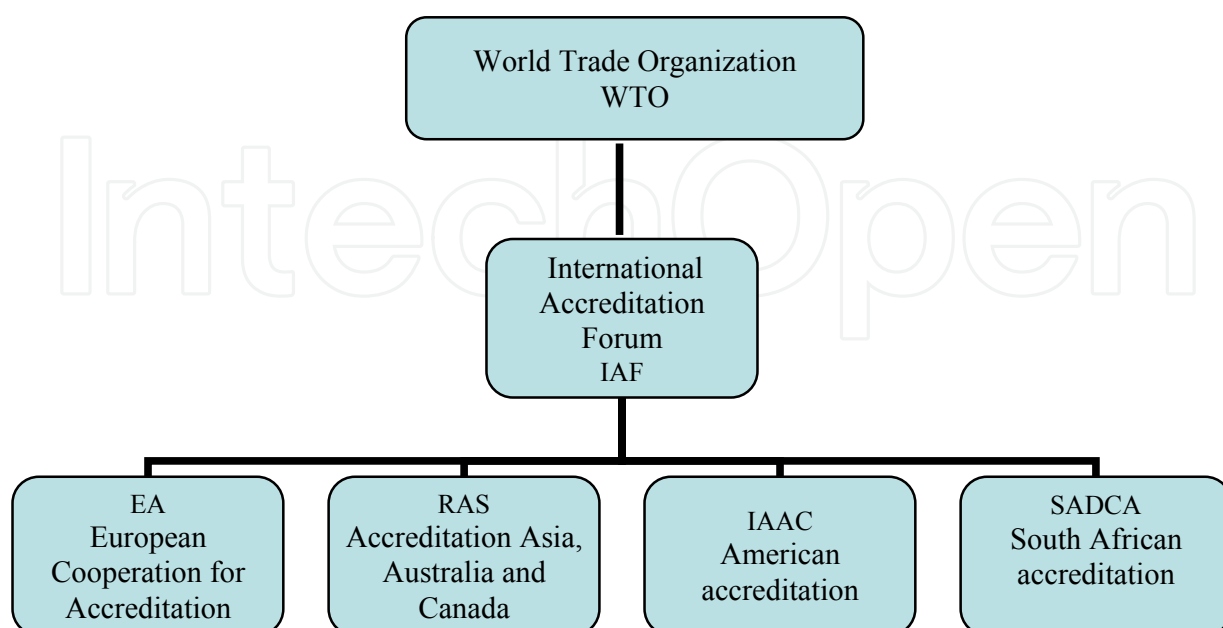

Figure 2. World Quality Control

Further quality control at the national level is done by certified bodies, inspection bodies, testing and metrology laboratories, the Institute for Standardization and Metrology, inspection systems and intellectual property protection.

3. Education and training for quality

A key resource is knowledge of modern business, and thus the improvement the quality of operations is based on the effective application of knowledge. Rapid technological changes are demanding higher and higher level of general knowledge, so that the level of development of a national economy is increasingly measured and brought into causal connection with the capability of creating and using knowledge. New type of professional skills necessary for the broader understanding of complex tasks, or successful completion of certain complex projects. For these reasons, the developed countries, to increase the participation of highly educated people in the employment structure. Human knowledge is treated as development potential, and is one of the basic elements of competitive advantage and national industry organizations, including the quality of products and services, as well as the quality of education and training for quality. In this sense, education and training for quality is a basic prerequisite for a successful build, implementation and promotion of the concept of quality management in every organization. Educated and professional people are a guarantee that the product or service will be good. Therefore, employees should not be viewed as a cost but as a value in which to invest.

One of the major problems facing the majority of local business organizations is the lack of application of the concept of quality management. Complete absence of change in the concept of quality management and its inadequate application resulted in the fact that there is a lack of competitive domestic organizations. At the conclusion of operations, especially in the case of businessmen from abroad, one of the first questions is all the more reports, "Are you accredited or certified by national accreditation bodies and accredited certification body." In other words, if you have established the concept of quality management.

Training and education are essential for the quality of any organization. All this begins from these. Training is needed for all employees, especially management-managers. There must be a permanent improvement of the knowledge life-long learing. For these reasons, every organization should adopt a program of education and training of management and employees (long and short). They are very distinctive and important role of training. The importance of education and training for quality is essential for the QMS, a primary and decisive role in improving the knowledge and skills of employees and management. The role of training is to enable employees to understand better the demands of their job.

4. Competence of education and training for quality

The need for education and training for quality is also expressed in the many standard requirements. Competence is the most important factor in the performance of any business, especially when it comes to education and training for quality. The basis for competence is knowledge. Knowledge is acquired through formal and informal education.

In a series standards ISO 9001:2000, ie, ISO 9001:2008, when the most significant innovation in education and training is their competence.

Competence can be mathematically presented through meetings or through cross-set of the three most important element in the education and training. These are: knowledge, the desire to work and work-place work. Graphic competence (K) is shown in Diagram-1.
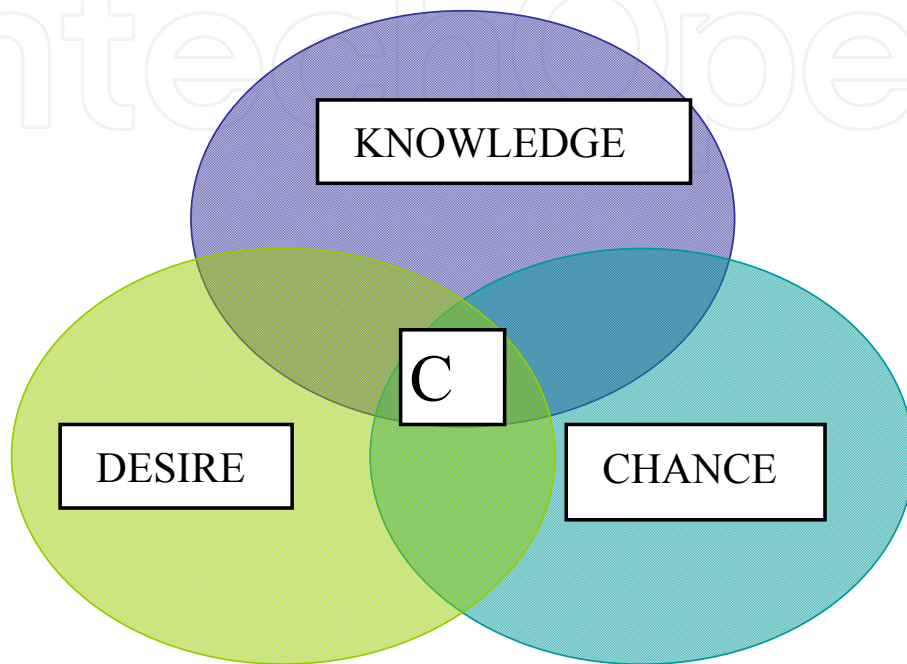

Diagram 1. Competence

DESIRE $\cap$ KNOWLEDGE $\cap$ CHANCE = COMPETENCE

There is International standard ISO 10015:1999 Quality Management – Guidelines for training. In this standard are given instructions and training cycle, as shown in Figure-3 However, a comprehensive evaluation of training can not be implemented until trained are not seen and tested it the workplace. Therefore, evaluation of training is done in two parts:

- Immediately after training,
- After observation and testing in the workplace.

Identification of training needs can be presented as overcoming what is missing, or the gap between what is happening and what we want to happen in the organization to quality products and meet customer requirements.

Knowledge (K) is one of the basic elements of social development and the institutions (I), technologies (T) and value system (VS) are the driving force-the power of society (PS). It can be displayed in the Diagram-2, by the sets.

$I \subset K \wedge VS \subset K \wedge T \subset K \Rightarrow PS = K \cap I \cap VS \cap T$

When it comes to education and training for the role of quality consultants and consulting firms are extremely important. The world is growing consulting industry, so that the sales potential of knowledge is increasing. The world arranged this issue in a way that they formed associations of consultancies. In Europe there is an association of national consulting house, according to which the members must meet, at a minimum, the common criteria
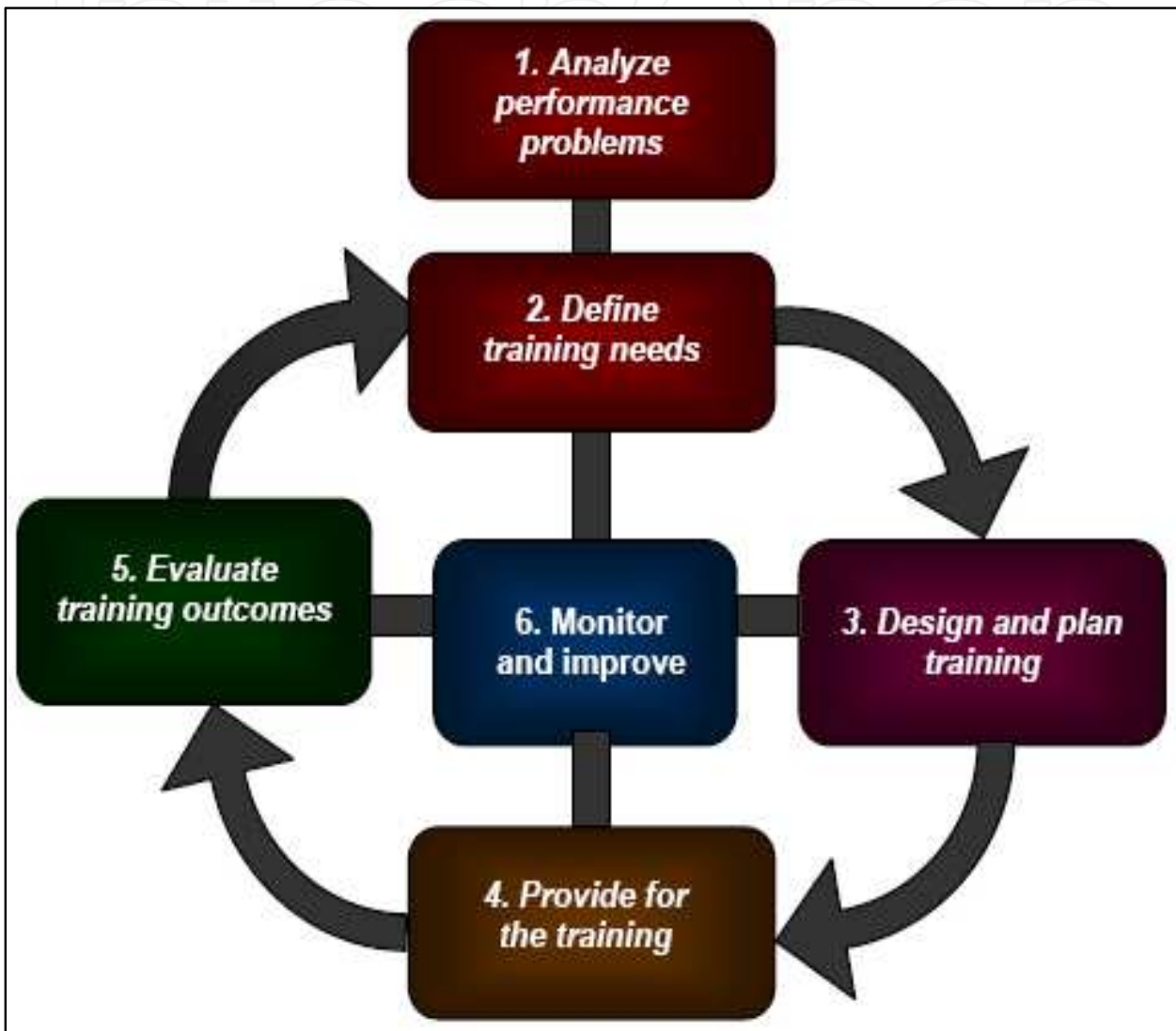

Figure 3. Training cycle

However, here arises the most important issue when it comes to training and education quality, and that is competence. Competence relates both to the trainer (trainer) for quality, and on all types of training. Obviously, it is necessary the need for management education and training for quality. For teachers is crucial to have a combination of theory and practice. For example, the assessor of the quality system that should have experience in introducing quality management system and he has to be theoretically prepared. In addition he has to possess personal qualities, in an order to understand

and interesting way to transmit knowledge. Also it is very important, who determines the competence.

Competence is synonymous with modern business [7].

This issue is not regulated in many countries it is similar in our country, so it is possible that the quality of training providers not competent, and there is no possibility to verify it. To solve this problem there is thought for doing so as stipulated in the documents IRCA-International Register of Certificated Auditors. First the organizations that conduct training are accredted. Then, the contractor must have training for accreditation: the selected program, selected and expertly documented, the documentation and accredited personnel. Therefore you should create a national registration system of independent monitoring and training, or a license from the relevant organizations in implementing and monitoring the quality of training. What organizations could apply to international standards and to maintain a register of accredited training and education for quality?
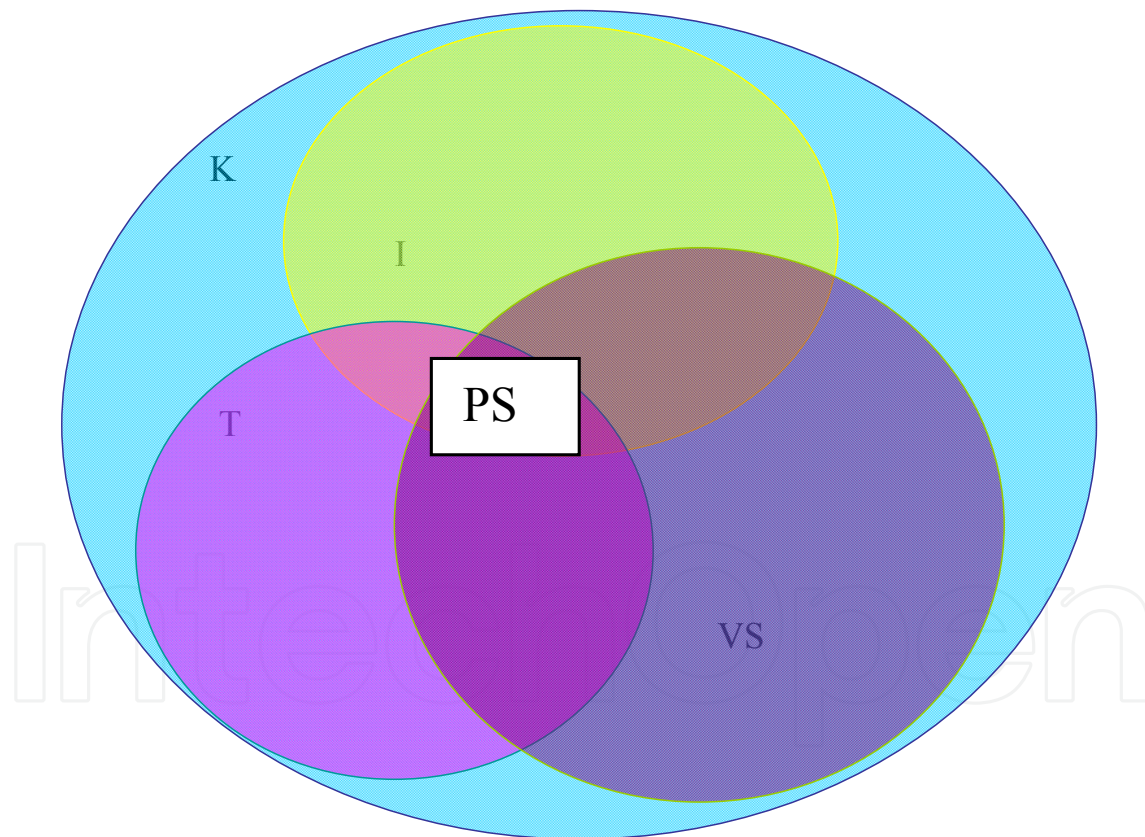

Diagram 2. Power of society

4.1. Research

Having in mind the problems exposed in this paper about the competence of education and training for quality in order to find possible solutions, the results of research. The research

was carried out with the competent organizations and people, or accredited organizations and people who deal with quality issues. The study was conducted on two occasions with an interval of eight years.

When contacting the respondents it is noted that they all gladly accepted and wanted to explore that contribute to the improvement of quality and improving the accreditation system. However, it must be noted that there are answers to all questions in the survey form, except several of them on one issue, which is related to the cost of education and training for quality accreditation. The reason not answering this question, according to their explanation is because in that period there was a change of ownership, and in some leadership. Sample of the research was picked, because it included almost all the accredited organizations which employed people with rich experience in the areas of quality and accreditation, which they have gained in our country and / or abroad. Their composition is impressive, not only for its expertise, but also because the organizations where they work. For example, a dean or vice dean for science, factory manager, and the highest percentage was of accredited organizations 47.82% then 30.43% of quality managers and 13.04% of respondents.

The analysis of survey data using the scientific method came to very interesting results on training people for jobs in the field of quality. . They can be grouped into three parts. The largest portion, 70% are those whom formal education is not enabled for activities related to quality (NO). The reason they stated as that programs did not search this issue. The second group (DO) of 20%, are those with formal education partially equiped, and only in the part of the quality control of products within individual subjects. The third group (OK) of 10% are those who are trained and have studied this issue only at postgraduate studies. Which means, according to this research, formal education did not educate or it did not quality enough the students for work in the field of quality in addition to postgraduate studies. Basically they were trained and they acquired skills in non-formal education. Beginning self-training over, attending and participating in conferences and seminars, scientific meetings, then, attendance and completion of local and foreign courses and schools in this area they acquired skills. It is clear that in all that invested much effort, time and money and it is a high capital value.

A repeated survey after eight years shows that the situation is more favorable in terms of formal education. This applies primarily to higher education. Training in the field of quality can be both at the postgraduate studies and at the undergraduate level, where there are scientific fields and disciplines such as management development, quality management and the similar. A large contribution to this improvement has contributed to the Bologna Declaration. One of three basic elements of the Bologna Declaration is just quality. Thus in many countries on almost all the colleges there is the subject of quality management. In secondary education was also made progress. In some educational profiles of there is the system of quality as optional or this field is studied in the frame of some other subject.

The results surveyed indicate that there have been improvements in training activities related to quality through formal education, but that does not mean that there is still much to improve. First of all, we need to improve the quality of research in the field through all forms of formal education, including preschool education. As for the competence of education and training for quality that is taught in formal education I was formally established as there are national Commission for the Accreditation Program, and the staff is not defined. Given that more and more intertwined formal and informal education and that the limit is decreasing, the common problems are such as competence education and training for quality. This is particularly true for countries in transition that are in the form of donations flooded with various trainings and with education and training for quality of questionable competence. To solve this problem, it is necessary to have management training and education for quality

4.2. Education management and training for quality

Education management and training is required and there must be an integral part of quality management systems namely the management.

To address the aforementioned problems, you should first improve the quality of management at the state level. It is essential that the state establishes a quality of infrastructure in accordance with international, regional and other standards, regulations and directives. It is essential for the existence of institutions: metrology, standardization, accreditation, conformity assessment and market surveillance. It is common to all these institutions of quality the they are nationally recognized organizations such as that in strictly defined rules and standards become members of regional and international organizations.

Continuous improvement of the accreditation system is particularly important . The results of other studies and the results of this research have helped to develop a model of continuous improvement of the national accreditation system. Both studies were done in the form of expert interviews with the application of scientific methods, techniques and procedures.

Education management and training for quality should be in accordance with the new philosophy of quality management, which is based on principles. The principle of orientation towards the customer-user may be considered or treated as a business philosophy, but philosophy which is transformed into action.

In order to improve education management and training for quality, competence and thus to improve the education and training for quality it is possible to define the model. The model should be in accordance with the new philosophy of quality management, based on its fundamental principles, particularly on the process and the principle of the system with constant improvement. Principle directions to customers / users can be treated as a business philosophy, but philosophy is transformed into action. The model consists of two groups of

factors that need to be optimized to achieve the developmental effects. The first three factors are factors that are the result of policy at the state level. By their nature they are opting for the fact that they have a significant impact on the quality of education. The second group includes factors that directly influence the direction of development of quality education and training for quality at the level of the national economy. They come from all interested parties and by their character are focussed

Decisive factors:

- State policy in the field of formal education.
- The role of state institutions in the field of stimulating education for quality.
- Development and organization of institutions of informal education.
- Transfer of knowledge from science to economy.
- The level of economic development.

The addressing factors:

- The degree of development of quality awareness to the community level.
- The degree of development of awareness of quality at the level of business organizations.
- The necessity of internationalization of business.
- The role of consumers in developing a climate for quality improvement.
- The role of media in the popularization and promotion of quality.

Quality education should be considered in all stages of formal education, from primary, secondary and higher schools. In elementary school, it could be done within a subject, for example, good manners, civic education, or similar subjects. In high school should be introduced a new subject-management of quality in all educational backgrounds, and in some would be the easiest way to introduce it instead the work organization. In the process of faculty quality is significantly affected and it is well on the way that all the faculties have the subjects of quality, and there are also studies in the field of quality.

Competence is the most important question in formal as well as in informal education. Competence relates both to the trainer, and all kinds of programs. For teachers is crucial to have a combination of theory and practice, for example that the teacher is the assessor of the quality system that the teacher has experience in quality system and to have theory. In addition the teacher should have to personal qualities, in order to understand and in an interesting way to transmit knowledge. Besides this there should be a national organization to establish competence - accreditation of education and training in quality as the register of accredited training and education, as well as its contractors. As possible organizations could be the excisting national accreditation body or the National Association for quality or National Association of consulting companies.

The world is growing consulting industry. Potential sales skills are growing. They arranged the matter so that they formed a national association of consulting companies. In Europe

there is a Federation of European associations of consulting organizations - FEACO, which consists of national associations of consulting firms. According to this association the national associations may require different conditions for membership, but must keep the following common criteria as a minimum:

- Independence.
- Expertise.
- Ethics.
- Experience.
- Qualifications.
- Verification.

5. Conclusion

- Quality management is necessary for continuous operation
- Management of continuous education and training for quality is needed, as a process that is integrated into quality management, i.e., management operations, in order to constantly improve the desires of the customer-user
- Education and training for quality should be competent and that is acquired during formal and informal education,
- The state should create conditions for normal operation of the economy, primarily by improving the quality of their management level.
- Investment in education and training investment in capital goods.
- Better cooperation with business organizations, scientific institutions,
- Effective application of knowledge,

This is a never-ending process that requires constant review and continuous improvement.

Author details

Vidoje Moracanin
University ALFA, Belgrade, Serbia

6. References

[1] D.Djordjevic, Quality as a factor in the competitiveness of domestic firms, Belgrade, 2003

[2] Aristotle., Metaphizika, Culture, Belgrade, 1960

[3] Z. Avramovic, Is a knowledge society a new type of society, the IER, 2007

[4] D. Stanivukovic, Quality and standards - The development and trends, Research Technology Center, Novi Sad, 1996.

[5] ISO 8402:1986 (1994), Vocabulary

[6]   ISO 9001:2000 , Fundamentals and vocabulary

[7]   V. Maistorovic Model TQM, Business Policy Belgrade. 2000