

8th International Strategic Management Conference

Implementation of Quality Management System ISO 9001 in the World and its Strategic Necessity

Jānis Priede^a, a*

^a University of Latvia, Riga, LV-1050, Latvia

Abstract

Over past 60 years quality management has shown its importance in increasing competitiveness of companies and economies. The aim of this paper is to review implementation process of the most popular and effective quality management system ISO 9001 in the world and identify its strategic necessity. This paper is divided into three parts. In the first part author introduces quality management as important part of economies competitiveness thru Global Competitiveness report. In the second part author examines benefits and strategic importance of quality management systems from perspectives of company. And in the third part author views a situation of ISO 9001 quality management system implementation in the world. At the end author makes conclusions about quality management system's implementation process in the world. Main method used in this paper is monographic method.

© 2012 Published by Elsevier Ltd. Selection and/or peer-review under responsibility of the 8th International Strategic Management Conference Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Keywords: Quality management, ISO 9001, strategic necessity

1. Quality Management as an Important Component of Economies Competitiveness

Competitiveness has increasingly gained currency across the globe. The international trade theories explain that different countries have different comparative advantages. Thus, if a country is rich in natural resources or capital, it has a comparative advantage over the others (Porter, 1990). However, in the current knowledge economy, knowledge as a resource has no natural home base and can be transferred easily anywhere in comparison to natural resources. This has made the XXI century more and more competitive (Pillania, 2009).

Competitiveness and country competitiveness rankings have increasingly become important and various studies are carried out on the subject. While competitiveness of enterprises has been studied by many scholars around the world, competitiveness of nations is a relatively new discipline (Garelli, 2006). There are two internationally well recognized

* Jānis Priede. Tel. +371-67034762; fax. +371-67034450

Email address: janis.priede@lu.lv

and popular annual rankings on the competitiveness of countries, namely Global Competitiveness Rankings and World Competitiveness rankings.

The Global Competitiveness Rankings study is conducted by the World Economic Forum.

Main coordinators and investigators of Global Competitiveness Report are Michael Porter and Klaus Schwab. They define competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the sustainable level of prosperity that can be earned by an economy. In other words, more competitive economies tend to be able to produce higher levels of income for their citizens. The productivity level also determines the rates of return obtained by investments in an economy. Because the rates of return are the fundamental drivers of the growth rates of the economy, a more competitive economy is one that is likely to grow faster over the medium to long run.

The concept of competitiveness thus involves static and dynamic components: although the productivity of a country clearly determines its ability to sustain a high level of income, it is also one of the central determinants of the returns to investment, which is one of the key factors explaining an economy's growth potential (Schwab, 2011).

The determinants of competitiveness are many and complex. For competitiveness ranking of the countries, Global Competitiveness Report introduces the Global Competitiveness Index (GCI). The GCI captures this open-ended dimension by providing a weighted average of many different components, each of which reflects one aspect of the complex reality that we call competitiveness. Authors group all these components into 12 pillars of economic competitiveness (Figure 1.).

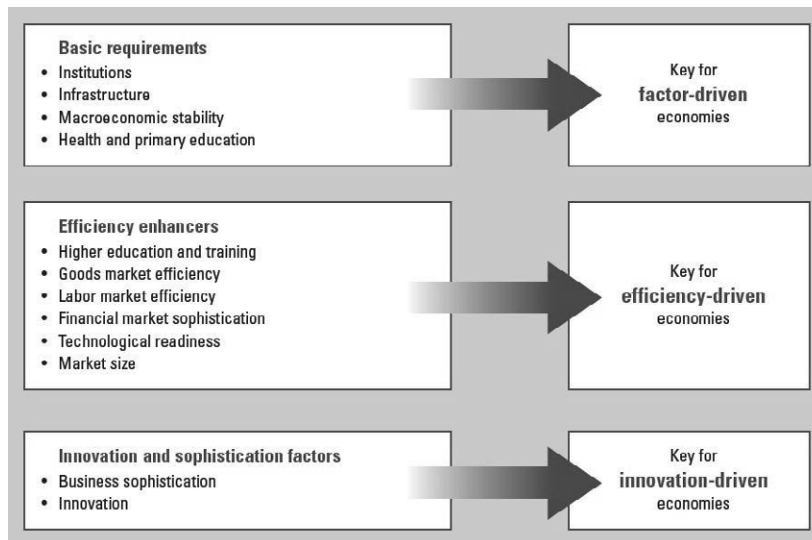


Fig. 1. The 12 pillars of competitiveness

If we look at those 12 pillars of competitiveness in detail, than “Business sophistication” pillar is the one where quality is mentioned. Quality issue will be discussed by the author later in this paper. Business sophistication is conducive to higher efficiency in the production of goods and services. This leads, in turn, to increased productivity, thus enhancing a nation's competitiveness. Business sophistication concerns the quality of a country's overall business networks as well as the quality of individual firms' operations and strategies. The quality of a country's business networks and supporting industries, which we capture by using variables on the quantity and quality of local suppliers and the extent of their interaction, is important for a variety of reasons. When companies and suppliers from a particular sector are interconnected in geographically proximate groups (“clusters”), efficiency is heightened, greater opportunities for innovation are created, and barriers to entry for new firms are reduced. Individual firms' operations and strategies (branding, marketing, the presence of a value chain, and the production of unique and sophisticated products) all lead to sophisticated and modern business processes (Schwab, 2011).

2. Quality Management Systems as a Strategic Tool to Increase Companies' Competitiveness

The question about necessity of quality management is very urgent these days, because global competition is increasing and entrepreneurs are looking for more competitiveness tools in order to survive.

Quality management systems are one of the most effective tools for companies to increase competitiveness. This issue have been studied for a long time since Dr. Edward Deming and Dr. Joseph Juran have started their studies and practical implementation of quality management and quality thinking in the companies 60 years ago. Although it was long time ago this topic is still very important these days because quality management systems are still effective and scientists are still researching this question. If we look at some recent publications than topical issues are: motives, benefits and strategic results from of ISO 9001 and impact on perception of customers (Casadesus, Karapetrovic, 2005, Zaramdini, 2007, Caro, Garcia, 2009, Rusjan, Alič, 2010), strategic orientation and financial performance of firms implementing ISO 9000 (Dimara, Skuras, Tsekouras, Goutsos, 2004), comparison of ISO 9000 in manufacturing and service organisations (Singh, Feng, Smith, 2006), ISO 9001 certification forecasting models (Sampaio, Saraiva, Rodrigues, 2011), quality thinking and system thinking in quality management (Conti, 2006, 2010) and components of successful total quality management (Tari, 2005). As we can see, quality management and ISO 9001 is still important object of research.

Now let's look at the reasons to implement quality management system based on standard ISO 9001 and benefits from it. In numberless sources we can find many reasons to implement quality management system and author think that main reasons are these:

1. Well defined and documented procedures improve the consistency of output. That means that all processes (or only those processes witch demand standard) in company are described in clear and easy understandable way for all employees and that leads to main idea of this standard – do all things right at first time.

2. Quality is constantly measured. That gives information to the top management whether all processes are running as it was defined and it also gives information about deviations from mean.

3. Procedures ensure corrective action is taken whenever defects occur. As mentioned before, constantly measures gives operative information about defects and then company can take all the necessary corrective actions and also by analyzing causes, define preventive actions. Here Ishikawa (the cause and effect) diagram is very useful (Figure 2).

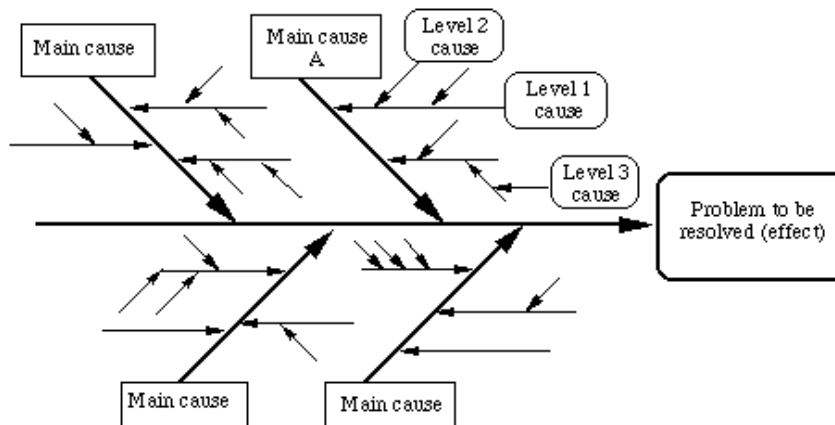


Fig. 2. Ishikawa diagram

4. Defect rates decrease. If company identifies and understands their problems and defines appropriate preventive actions, than it is logical result from all these actions.

5. Defects are caught earlier and are corrected at a lower cost. This is very important benefit. If procedure is well written, than it is possible to identify problem at a very early stage. That is the whole idea of process management. In this case we don't control only result, but also whole process and leads to cost reduction.

6. Documented procedures are easier for new employees to follow. It is very critical issue for companies with great labour turnover. And documented procedures assure that new employee will start to work effectively as soon as possible.

7. Organizations retain or increase market share, increasing sales or revenues.

8. Lower production costs because of fewer nonconforming products, less rework, lowered rejection rates, streamlined processes and fewer mistakes. Here we can talk about quality cost analysis. By analyzing quality costs, company can identify places where to optimize costs (Figure 3).

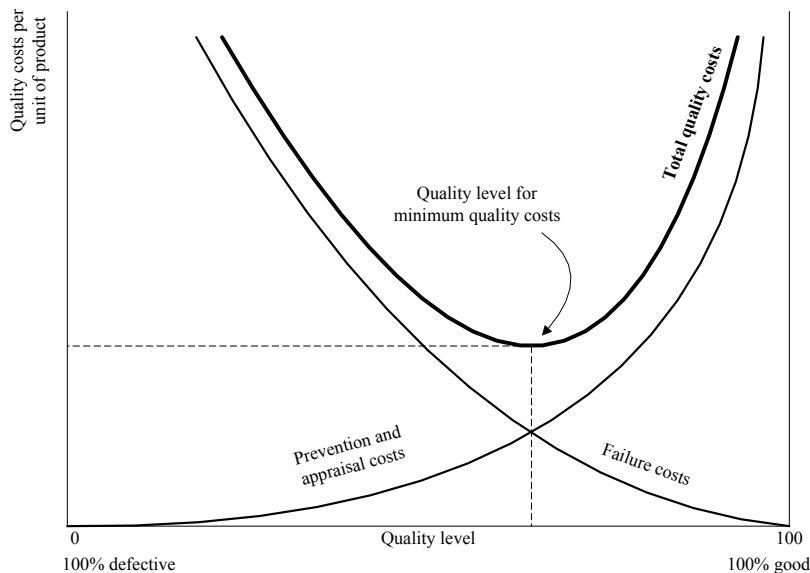


Fig. 3. Juran's model of optimum quality costs

The costs associated with quality are divided into two categories: costs due to poor quality and costs associated with improving quality. Prevention costs and appraisal costs are costs associated with improving quality, while failure costs result from poor quality. Management must understand these costs to create quality improvement strategy. An organization's main goal is to survive and maintain high quality goods or services, with a comprehensive understanding of the costs related to quality this goal can be achieved.

Costs are defined as the summation of costs over the life of a product. Customers prefer products or services with a high quality and reasonable price. To ensure that customers will receive a product or service that is worth the money they will spend firms should spend on prevention and appraisal costs. Prevention costs are associated with preventing defects and imperfections from occurring.

The focus of a prevention cost is to assure quality and minimize or avoid the likelihood of an event with an adverse impact on the company goods, services or daily operations. This also includes the cost of establishing a quality system. A quality system should include the following three elements: training, process engineering, and quality planning. Quality planning is establishing a production process in conformance with design specification procedures, and designing of the proper test procedures and equipment. Consider establishing training programs for employees to keep them efficient on emerging technologies, such as updated computer languages and programs (Juran, Godfrey, 2000).

Appraisal costs are direct costs of measuring quality. In this case, quality is defined as the conformance to customer expectations. This includes: lab testing, inspection, test equipment and materials, costs associated with assessment for ISO 9000 or other quality award assessments. A common example of appraisal costs is the expenses from inspections. An organization should establish an inspection of their products and incoming goods from a supplier before they reach the customer. This is also known as acceptance sampling, a technique used to verify that products meet quality standards.

Failure costs are separated into two different categories: internal and external. Internal failure costs are expenses incurred from online failure. This includes cost of troubleshooting, loss of production resulting from idle time either from manpower or during the production process. External failure costs are associated with product failure after the completion of the production process. An excellent example of external failure costs is the Johnson&Johnson cyanide scare. The company incurred expenses in response to the customer fears of tampering with a purchased

Johnson&Johnson product. However, Johnson&Johnson managed to survive the incident, in part because of their method of corrective action.

When Philip Crosby introduced 14 step quality improvement process, step Nr.7 was “Zero Defects”. Based on this process Arthur M. Schneiderman adopted this idea for Juran’s model of optimum quality costs and called it “Optimum quality level equals zero defects” (Figure 4).

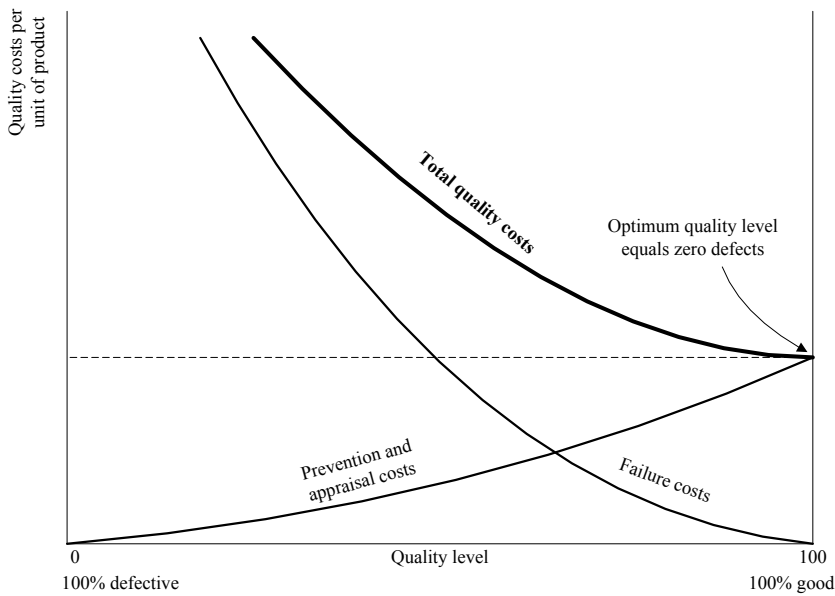


Fig. 4. Optimum quality level equals zero defects

Philip Crosby and Arthur M. Schneiderman thought that it is possible to reach the level where total quality costs reach the lowest point at the zero defects.

R. J. Shonberger and E. M. Knod in their book developed Schneiderman’s quality costs model and introduced their own (Figure 5).

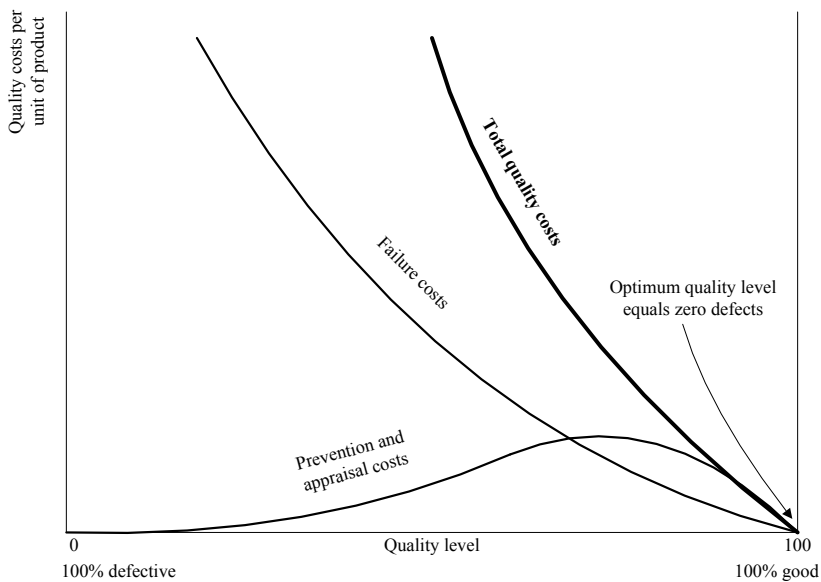


Fig. 5. Optimum quality costs

They thought that with a time it is possible to reduce total quality costs to the minimum. It is possible when quality assurance and management is integral part of company and prevention and appraisal costs start to reduce.

According to the author, quality costs model in Figure 3 is very theoretical and in real business it is almost impossible, although with a time it is possible to reduce prevention and appraisal costs but it is almost impossible to get along without them.

Understanding the cost of quality is extremely important in establishing a quality management strategy. After defining the three major costs of quality and discussing their application we can examine how they affect an organization. The more an organization invests in preventive measures the more they are able to reduce failure costs. Furthermore, an investment in quality improvement benefits the company image, performance and growth. This is basically summed up by the Ludvall-Juran quality cost model, which applies the law of diminishing returns to these costs. The model shows that prevention and appraisal costs have a direct relationship with quality conformance, meaning they increase as quality conformance increases. Thus, quality conformance should have an inverse relationship with failure costs - meaning as quality conformance increases failure costs should decrease. Understanding these relationships and applying the cost of quality process enables an organization to decrease failure costs and assure that their products and services continue to meet customer expectations. Some companies that have achieved this goal include Neiman-Marcus, Rolex, and Lexus.

Phillip Crosby states that quality is free. As discussed in this paper, the costs related to achieving quality are traded off between the prevention and appraisal costs and the failure costs. Therefore, the prevention and appraisal costs resulting from improved quality, allow an organization to minimize or be free of the failure costs resulting from poor quality. In summation, understanding cost of quality helps companies to develop quality conformance as a useful strategic business tool that improves their products, services and image. This leverage is vital in achieving the goals and mission of a successful organization.

Process improvement and optimization of costs of quality gives company opportunity gain more profit at the same prices (Figure 6).

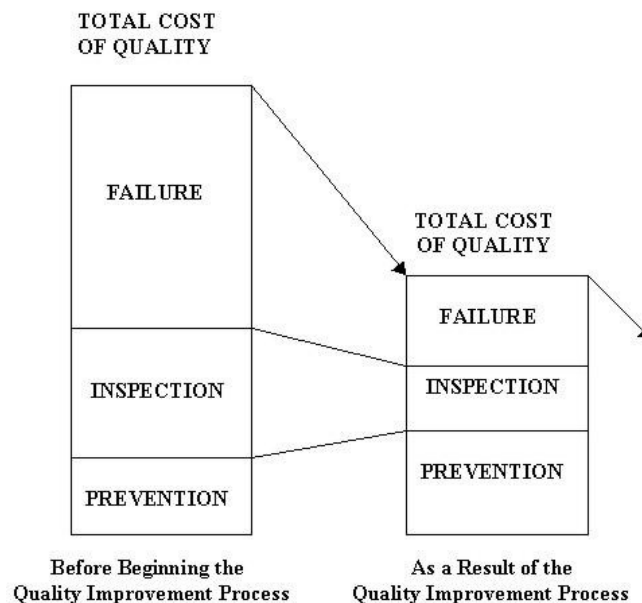


Fig. 6. Reduction costs of quality

The total cost of quality reduces as the quality improvement process proceeds, prevention costs increase, while inspection and failure costs decrease (Juran, Godfrey, 2000).

That means there will be more money to invest in company or pay more dividends to investors. Other opportunity is to lower prices and gain more market share.

Reduced costs are obtained through: Improved product reliability, better process control and flow, better documentation of processes, greater employee quality awareness, reductions in product scrap, rewords and rejections, etc.

9. Some markets require ISO 9001 certificate, some markets favour companies with ISO 9001 certificate.

In the third part of the article author will examine implementation of quality management system ISO 9001 in the world and will determine its importance.

3. Implementation of Quality Management System ISO 9001 in the World

In this part author examine the process of implementation of quality management system ISO 9001 in the world.

In Figure 7 author showed amount of issued ISO 9001 certificates and number of countries where system was implemented during the years 1993 – 2010.

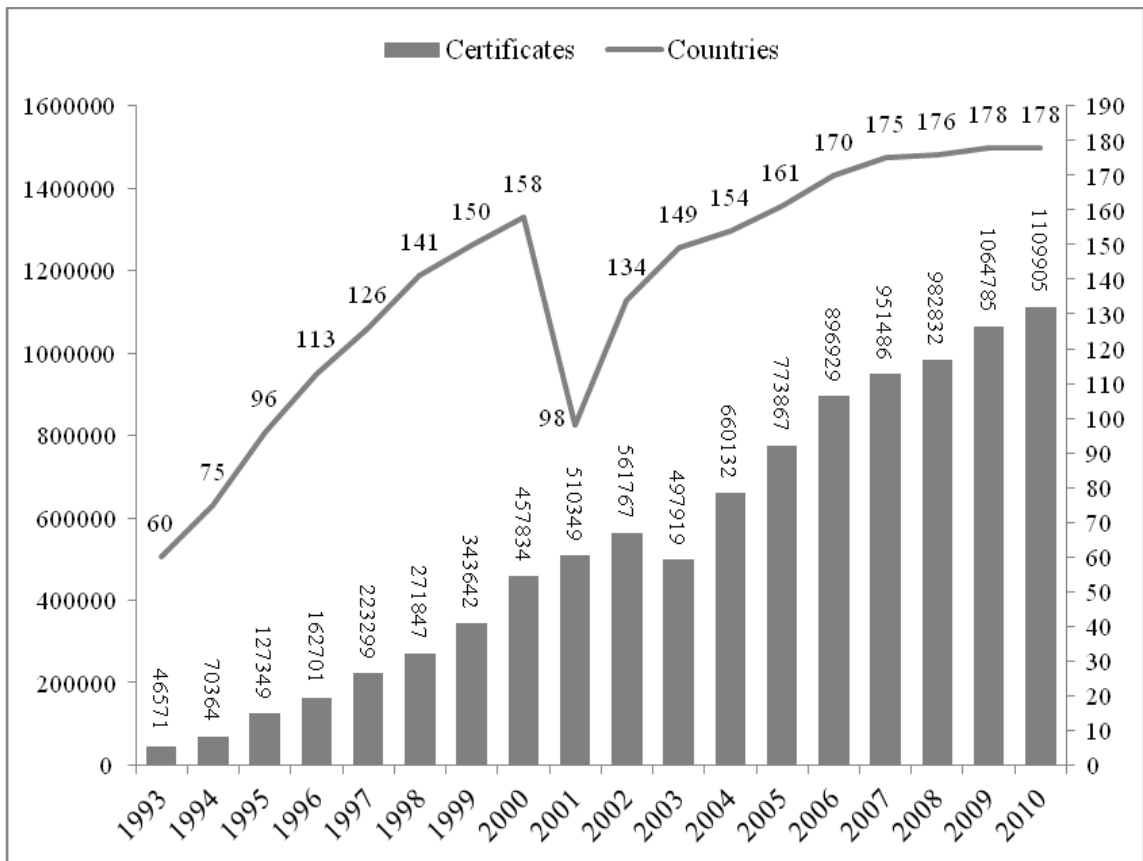


Fig. 7. Total amount of issued ISO 9001 certificates and countries in the world, years 1993-2010

Overall we can see that number of certificates and countries involved are increasing and has increased rapidly since 1993, countries: form 60 in year 1993 till 178 in year 2010; certificates: from 46571 in year 1993 till 1109905 in year 2010. It is more than one million companies and organisations globally that implement the same principles of excellent business practice. There was significant drop in amount of certificates in year 2003 (Figure 8), but that can be explained by changes in standard version – from ISO 9001:1994 to ISO 9001:2000. Interesting, that biggest decrease in amount of certificates was in Europe. In year 2003 total amount of certificates decreased by 63848 certificates and larges portion was in Europe – 50423. The only region which showed increase during year 2003 was Far East + 14488 and Far East is the only region where amount of certificates has never decreased. That shows the high level of commitment to quality management.

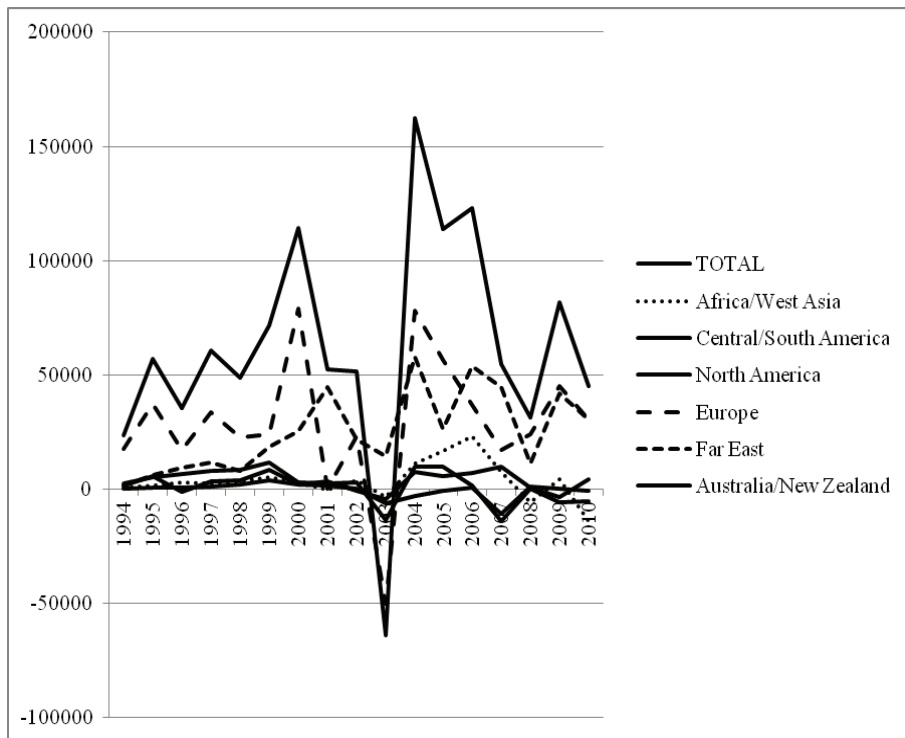


Fig. 8. Annual growth of issued ISO 9001 certificates in the world and by regions

As Far East was showing very good results in implementing ISO 9001 quality management system, than it make sense that Far East are represented in top 10 countries for ISO 9001 certificates in year 2010 (Figure 9).

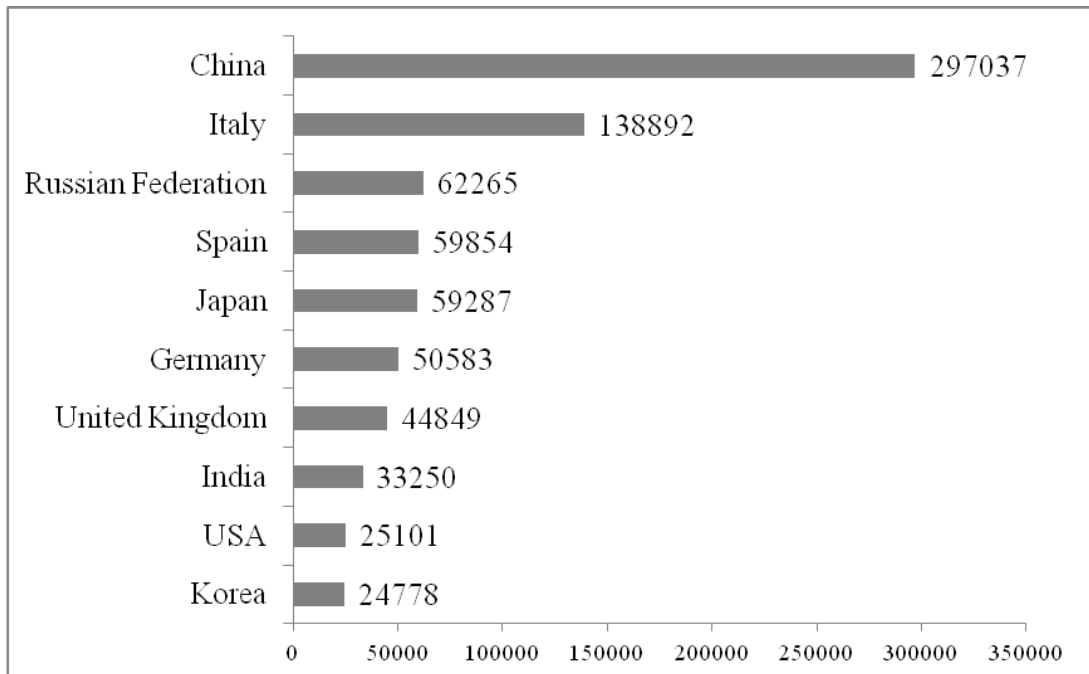


Fig. 9. Top 10 countries for ISO 9001 certificates in year 2010

Author would like to point out rapid certification increase in Russian Federation. In year 2010 there was 62265 certificates and third place in the world. In the year 2007 there were 11527 certificates in Russian federation and they were not in the top 10 and in year 2001 there were just 35 certificates! That indicates that entrepreneurs in Russian Federation perceive ISO 9001 as a strategic tool for improving the processes and accessing foreign markets.

If we look at the regional shares (Figure 10) we can see that share of Europe has decreased over the years: from 81% in year 1993 to 47,8% in year 2010.

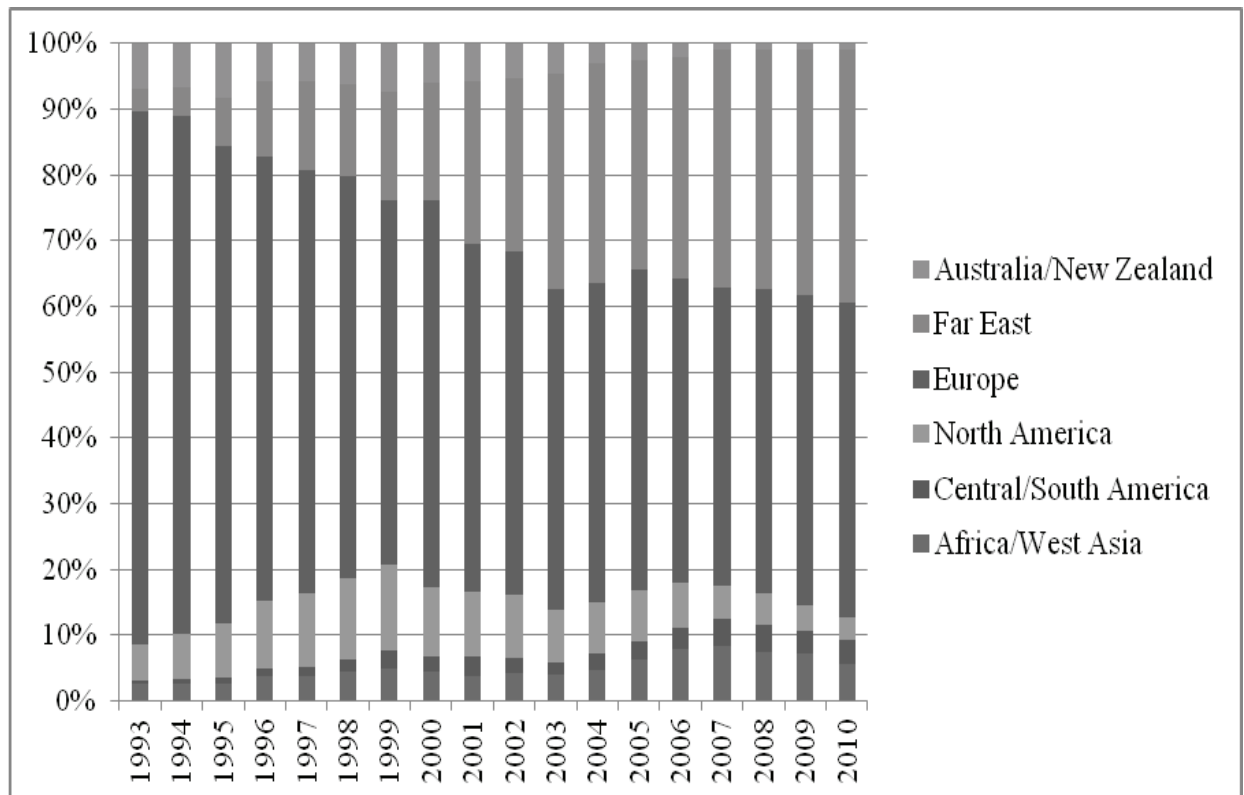


Fig. 10. Regional shares of ISO 9001 certificates, %

Such Europe's decrease in share is explained by increasing share of Far East: only 3% in year 1993 to 38,6% in year 2010. This shows that Far East countries and companies are engaging in quality movement in order to raise competitiveness of companies and countries.

4. Conclusions

Quality is still very important and strategic component of competitiveness. We can find quality as component in Global Competitiveness report which determines countries growth towards innovation economy.

One of the most popular quality management systems in the world is ISO 9001 standard. It has many benefits that make it so popular within entrepreneurs. In year 2010 there were more than one million companies and organisations with certificated quality management system according to standard ISO 9001.

Europe and Far East makes 86,4% of all ISO 9001 certificate amount (Europe – 47,8%, Far East – 38,6%). These regions are most engaged in quality management from perspectives of ISO 9001 recognizing quality management as strategic tool for improving processes, accessing foreign markets and increasing competitiveness.

References

Caro, L.M., Garcia, J.A. (2009), "Does ISO 9000 certification affect consumer perceptions of the service provider?", *Managing Service Quality*, Vol. 19 No. 2, pp. 140-161

- Casadesus, M., Karapetrovic, S. (2005), "The erosion of ISO 9000 benefits: a temporal study", *International Journal of Quality & Reliability Management*, Vol. 22 No. 2, pp. 120-136
- Conti, T. (2010), "System thinking in quality management", *The TQM Journal*, Vol. 22 No. 4, pp. 352-368
- Conti, T. (2006), "Quality thinking and system thinking", *The TQM Magazine*, Vol. 18 No. 3, pp. 297-308
- Dimara, E., Skuras, D., Tsekouras, K., Goutsos, S. (2004), "Strategic orientation and financial performance of firms implementing ISO 9000", *International Journal of Quality & Reliability Management*, Vol. 21 No. 1, pp. 72-89
- Garelli S. (2006), "Changing the mindset of competitiveness", On-line: <http://www.imd.ch/research/challenges/TC060-06.cfm>
- Juran, J.; Godfrey, A. (2000), *Juran's Quality Handbook*. Fifth Edition. McGraw-Hill, 1872 p.
- Pillania R. K. (2009), "Competitiveness and emerging markets", *Business Strategy Series*. Vol.10, Issue 2, pp. 90-95.
- Schwab K. (2011) *The Global Competitiveness Report 2011-2012*. – Geneva, World Economic Forum, 544 p.
- Porter M. (1990), *Competitive Advantage of the Nations*. – New York, Free Press, 857 p.
- Rusjan, B., Alič, M. (2010), "Capitalising on ISO 9001 benefits for strategic results", *International Journal of Quality & Reliability Management*, Vol. 27 No. 7, pp. 756-778
- Sampaio, P., Saraiva, P., Rodrigues, A.G. (2011), "ISO 9001 certification forecasting models", *International Journal of Quality & Reliability Management*, Vol. 28 No. 1, pp. 5-26
- Schneiderman, A. M. (1986), "Optimum Quality Costs and Zero Defects: Are They Contradictory Concepts?", *Quality Progress*, American Society for Quality Control
- Schonberger, R. J., Knod, E. M. (2001), *Operations Management: Meeting Customer's Demands*, McGraw-Hill/Irwin; 7 edition
- Singh, P.J., Feng, M., Smith, A. (2006) "ISO 9000 series of standards: comparison of manufacturing and service organisations", *International Journal of Quality & Reliability Management*, Vol. 23 No. 2, pp. 122-142
- Tari, J.J. (2005), "Components of successful total quality management", *The TQM Magazine*, Vol. 17 No. 2, pp. 182-194
- The ISO Survey 2011. – Geneva, ISO Central Secretariat, 30 p.
- The ISO Survey 2005. – Geneva, ISO Central Secretariat, 22 p.
- The ISO Survey 2000. – Geneva, ISO Central Secretariat, 19 p.
- Zaramdini, W. (2007), "An empirical study of the motives and benefits of ISO 9000 certification: the UAE experience", *International Journal of Quality & Reliability Management*, Vol. 24 No. 5, pp. 472-491