Katarina Kanjevac Milovanovic[1]

THE REVIEW OF PROBLEM AND THE ADVANTAGE OF INVESTING IN A PROJECT OBTAINING *CE* MARK

Abstract: There is no competitive national economy without discharging the most important condition and those are competitive products that satisfy technical and safety market requires, that is, products with the CE mark. The aim of this work is to highlight the problems and the main limitations in obtaining the CE mark, and the benefits and justification of investment in the CE mark. The research was conducted in three directions. First he research conducted the quality of the existing infrastructure in Serbia. Then we went on to research many problems in obtaining the CE mark. To test the feasibility of investing in obtaining the CE mark was used cost benefit analysis. Based on the results, the results presented in this work strongly suggests that investment in obtaining resources for labeling of products has a high rate of return.
Keywords: CE mark, competitiveness, cost benefit, quality

1. Introduction

The infrastructure of quality, as a group of special rules, is a prerequisite to promote products, processes and services so that they become safer, of higher quality as well as more competitive. The establishment and development of the quality infrastructure is the one of the most important steps for membership of the Europian Union. Last years Serbia, on its way to the Europian integration, laid the foundation of the quality infrastructure what the established new legal and institutional framework of the quality infrastructure talks about. Although lagging behind its neighbours in terms of the quality infrastructure , Serbia works tirelessly to its strengthening, removing existing impediments, as well increasing the capacity

of the implementation of existing international standards and trade regulations, in order to achieve higher quality, safer and more competitive product which will provide its place in the Europian Union (Velloso, 1991; Haque, 1991; Porter, 2007; Porter, 1990; Porter, 2008; Porter, 1987; Porter, 1995).

The second big problem which our companies are faced, is the quality, safety and the competitiveness of a product. The low price of a product is not a factor of competitiveness of developed countries for a long time. What sells the product is its design, safety and build quality. For example, on the market of the Europian Union certain categories of the product can be qualified only if they are made by so-called harmonized standards and if they have CE mark.

It should be noted that Serbia has significantly progressed in terms of the

---

[1] Corresponding author: Katarina Kanjevac Milovanovic email: kanjevac@kg.ac.rs

quality infrastructure for the last ten years. Increasing of volume of the trade with the Europian Union, then the increasing of the number of accredited laboratories, the number of control organizations as well as very highly rated work of the Accreditation Board of Serbia by the Europian Accreditation are just some of progress indicators, but in spite of all efforts Serbia still lags behind its neighbours.

2. Proposed framework

The basic subject of this work is to show how problems and benefits of investing in the project to obtain the CE mark of products.

There is no competitive national economy without discharging the most important condition and those are competitive products that satisfy technical and safety market requires, that is, products with the CE mark.The aim of this work is to highlight the problems and the main limitations in obtaining the CE mark, and the benefits and justification of investment in the CE mark.

2.1 Basic hypotheses

Starting points in the preparation of this paper are based on the application of systems theory and especially of certain models and simulations of dynamic economic systems. Based on these grounds, it will use the following initial hypotheses (Kanjevac and Milivojevic, 2005; Arsovski *et al*., 2006; Project Europe Aid 114680, 2004; Rosic, 2004; Popovic, 2010):

H1: quality of the existing infrastructure is not sufficiently developed for the application of the New Approach directives,

H2: Organizations that have established management system (QMS, OHSAS) with small investments are ready to implement the New Approach directives,

H3: Investing resources in obtaining

the CE mark for the products has a high rate of return.

2.2 Methods are used

The aim of the research we have developed a model for assessing the impact of the New Approach directives to the competitiveness of products and companies as a whole. This model has become the subject of a review in practice.

On the basis of this model, we have made a questionnaire. On the results we apply methods of statistical analysis, simulation methods, and methods of improving quality.

3. Possible problems of obtaining ce mark

The lack of awareness of the importance of CE mark, certification and other elements of the infrastructure quality as well as the slowness of acceptance of the international standards, leads precisely to the fact that the products in Serbia are not in accordance with the Europian Union standards and requirements, or it is the very small number of the same. On the other hand, domestic companies meet problems with the lack of information, insufficient organization inside the company itself, as well as the lack of funding to cover the costs of consulting services, testing services and services of authorized (notification) bodies, and all this leads to creating a barrier that keeps track the programme of products harmonization with the application of the new approach directives and obtaining CE mark in our country. The following are the testing results when the problems arised by obtaining CE mark are analyzed in terms of the percentage of the company, what is shown in Table 1 and in Figure 1 (Arsovski and Kanjevac Milovanovic, 2008; Arsovski and Kanjevac Milovanovic, 2009; Kanjevac Milovanovic and Arsovski, 2009; Kanjevac Milovanovic and Arsovski, 2010).

Table 1. Possible problems of obtaining CE mark

| No	Problems-barrier	%response	No	Problems-barrier	%response
1.	Lack of knowledge management and employees	**51.43**	8.	Low employee motivation	**34.28**
2.	Declaratively involvement management (and owners)	**28.57**	9.	Significant other priorities	**54.28**
3.	Incomplete compliance system	**62.86**	10.	Failure to realize the anticipated benefits	**5.71**
4.	Insufficient engagement of consultants	**2.86**	11.	Different requirements of stakeholders	**25.71**
5.	Cost of training and consultancy	**65.71**	12.	Constantly changing rules and regulations	**11.43**
6.	Testing costs	**82.86**	13.	Lack of market benefits of the product with the CE mark	**8.57**
7.	Cost notification	**74.28**			
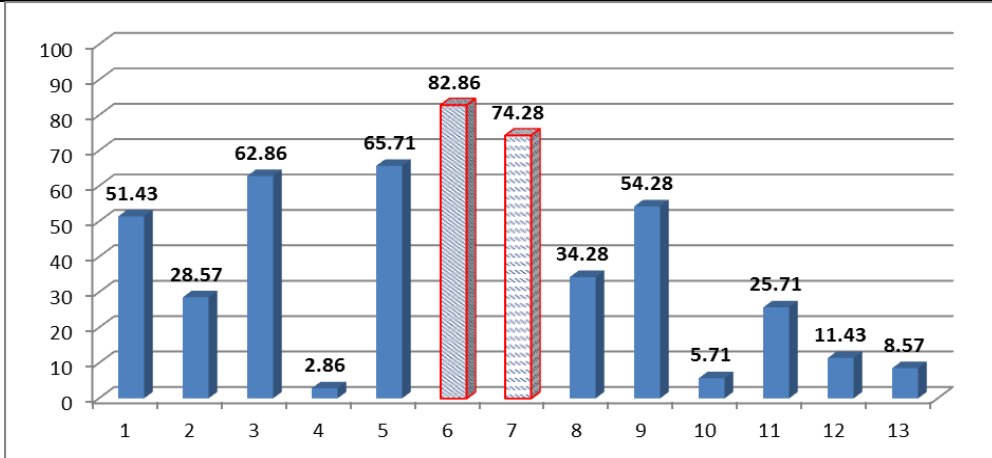
Figure 1. Problems of obtaining CE mark

The Europian Union insists on its free market can only exist products that meet the quality requirements. That practically means that:

- organizations (producers) have to have sertified Quality Management System as a third party confirmation that they are able to continually meet the quality requirements and

- organizations have to have products that meet specific requirements (CE mark) and/or safety requirements in their use.

To achieve this goal there is the quality infrastructure, which one part is shown in figure 2.
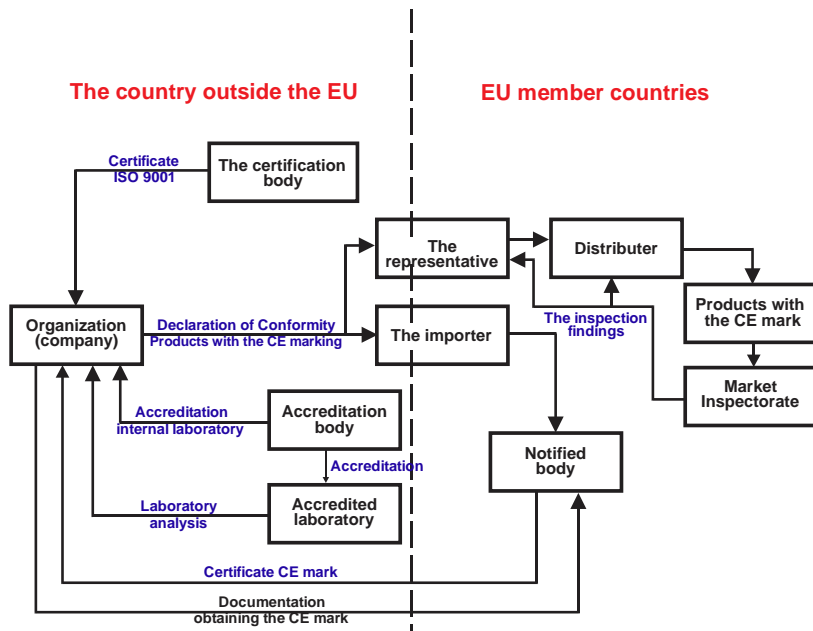
The country outside the EU | **EU member countries**

Figure 2. Infrastructure quality between manufacturer - EU market (Arsovski, 2004)

Companies that overcome all mentioned problems meet new impediments, and they are:

- In Serbia there are no authorized laboratories for most needed tests imposed by requirements of the new approach directives and following harmonized standards;

- The accreditation body does not have the full range of accreditation, needed for acheiving Declaration of conformity and CE mark for products.

The results of the conducted research indicate that for 48% of products, of total 111 analysed products, were needed to perform the tests, necessary for obtaining CE mark, in laboratories outside our country. The reason for this is the unexisting of necessary authorized laboratories in Serbia. By the further analysis it is concluded that more than 80% of researches connected to building products industry are conducted abroad, because in Serbia there are no authorized laboratories. The same problem occurs of medical products, but the percentage of the products tested in

laboratories abroad is smaller and it is 20%. Aparts of building and medical industry for products of mechanical industry, for now all tests can be done in our laboratories.

The shown results of researches, as well as coclusions made on the basis of experiences of experts, confirm the hypothesis H1: the existing quality infrastructure in Serbia is not developed enough for the use of the new approach directives.

When establishing menagement system, because of the new approach directives, the manufacturer must establish and document the essential requirements more significant for products and which harmonized standards or some other technical solutions should be used in ordre to provide the fullfilment of the essential requirements. Measures taken by the organization to control production must provide compliance of the product with the set safety requirements. Quality documents must be adequate so that the fulfilment of important requirements can be provided.

Management systems should help manufacturers to meet their obligations

based on the new approach directives and needs of users at the same time. Under certain conditions, thus enabling manufacturers to benefit from their investments in management system.

The researches show that aproximately 50% of tested organizations are sertificated by QMS, while some of them also have established integrated management systems. These organizations in the preparation of technical documentation fot the CE mark calls for procedures of QMS (the procedure of the development, production, procurement ...). Experiences in providing consulting services during the process of obtaining CE mark, indicate that more and more organizations opt for integration of the process of obtaining CE mark as well as the establishment of management system by quality, primarily for financial reasons. This proves the third hypothesis H3: the organizations that established management system (QMS; OHSAS) with small investments are ready for the preparation of the new approach directives.

4. Cost benefit feasibility analysis of investing in ce mark

Cost benefit analysis is a special method of economic analysis to compare and evaluate all advantages and disadvantages of some economic enterprise or a project by cost analysis and benefit analysis. It is important for making the right decision and the correction of a project. From the one side all the income and benefits of enterprise are added up, but from the other side expenses and losses of a project as well. All income and benefits, expenses and losses must be quantified and reduced to the same measurable unit (mostly to money). If the quotient of income and benefits, and expenses and losses, actually coefficient greater than one, therefore If income and benefits overcomes expenses and losses, then it is about financially viable venture.

Expenses and losses that are the result of investing in some project are single and certain, while income and benefits are long-term and uncertain. This may complicate the procedure of cost benefit analysis.

For testing of justification investment in obtaining CE mark is used the cost benefit analysis and on the basis of the form (1):

$$\frac{\text{benefit}}{\text{cost}} = \frac{Up_2 - UP_1}{\text{INVESTMENT}} = \frac{C_2 * Z_2 - C_1 * Z_1}{\text{INVESTMENT}} \quad \textbf{(1)}$$

In the form (1):

- UP1= total income before obtaining CE mark,
- UP2= total income after obtaining CE mark,
- C1= product cost before obtaining CE mark,
- C2= product cost efter obtaining CE mark,
- Z1= amount of product produced before obtaining CE mark, annually,
- Z2= amunt of product produced after obtaining CE mark, annually.

Cost benefit analysis is made for the seven most common products of conducted research. The resuls of cost benefit analysis are shown in the table 2 .

So that we could prove the forth analysis, for the products shown in the table 2, we will calculate the cost-effectiveness. The cost-effectiveness is (2):

$$profitability = \frac{profit}{investment} = \frac{U_{p_2} - MT_2}{investment} \quad (2)$$

In the form 2:

- UP2= total income after achieving mark CE,
- MT2= material costs +the costs of producing + fixed costs + taxes and contributions.

In this expression 2 variable MT2 is unknown. So that we could calculate the cost-effectiveness, we will use values from the table 3, and on the basis of expression (2) the cost-effectiveness for products shown in the table 2 can be calculated. The cost-

effectiveness of the most numerous key products in relation to all products that were involved in the survey is shown in the table 4.

This mentioned example shows that this is a cost-effective entrepreneurial venture, what

represents a proof of hypothesis H4: resource investment in obtaining CE mark for products has a high rate of cost-effectiveness.

Table 2. The results of the cost benefit analysis

	Machines			Medical Products		Building products	Toys
	Product 1	Product 2	Product 3	Product 4	Product 5	Product 6	Product 7
C_2 (in dinars)	250.000,00	225.000,00	200.000,00	5,00	15,00	13.250,00	3.500,00
Z_2 (No. of unit.)	15	9	10	150.000	200.000	750	2.000
C_1 (in dinars)	150.000,00	150.000,00	135.000,00	4,00	13,00	12.500,00	3.000,00
Z_1 (No. of unit.)	8	5	5	100.000	175.000	700	1.800
Investment (in dinars)	50.000,00	70.000,00	35.000,00	20.000,00	25.000,00	30.000,00	50.000,00
B/C	51	18.21	37.86	17.5	29	39.58	32

Table 3. The ration of total income and material expenses

	Machine industry	Medical industry	Building industry	Toy industry
UP/MT	1.1	1.50	1.05	1.40
PROFIT	$0.1*(Z_2*C_2)$	$0.05*(Z_2*C_2)$	$0.40*(Z_2*C_2)$	$0.50*(Z_2*C_2)$

Table 4. The cost-effectiveness of products

Profitability	Machines			Medical Products		Building products	Toys
	Product 1	Product 2	Product 3	Product 4	Product 5	Product 6	Product 7
	7.5	2.89	5.71	18.75	60	16.56	70

5. Goals of ce marking

The last question of the questionnaire, is related to ranking performance targets of CE mark. The surveyed companies are offered seven goals, with ranking from I to VII (I- the highest ranking, VII- the lowest ranking). Taking as a measure of decreasing range of the majority of response on targets, shown in

the table 5. the cumulative rank is received. The first rank is related to the increase in market share of customer number (figure 3), bearing in mind that this element is one of the basic requirement of successful business of company. On the third place is an increase in profits, which met following the first two ranks.

Table 5. Goals of CE marking

| Performance	RANG							Realised rang
	I	II	III	IV	V	VI	VII	
Increase customer satisfaction	1	4	3	5	2	14	6	VI
Increase profits	7	4	4	2	15	3	/	V
Reduction of costs	13	4	2	5	4	4	3	I
Increasing market share-the number of customers	5	8	3	4	4	1	10	VII
Reduction in incidents and accidents	3	1	15	6	3	6	1	III
Reduction of legal violations	/	3	4	14	5	5	4	IV
The quality of the process for obtaining the CE mark	6	12	4	/	2	1	10	II
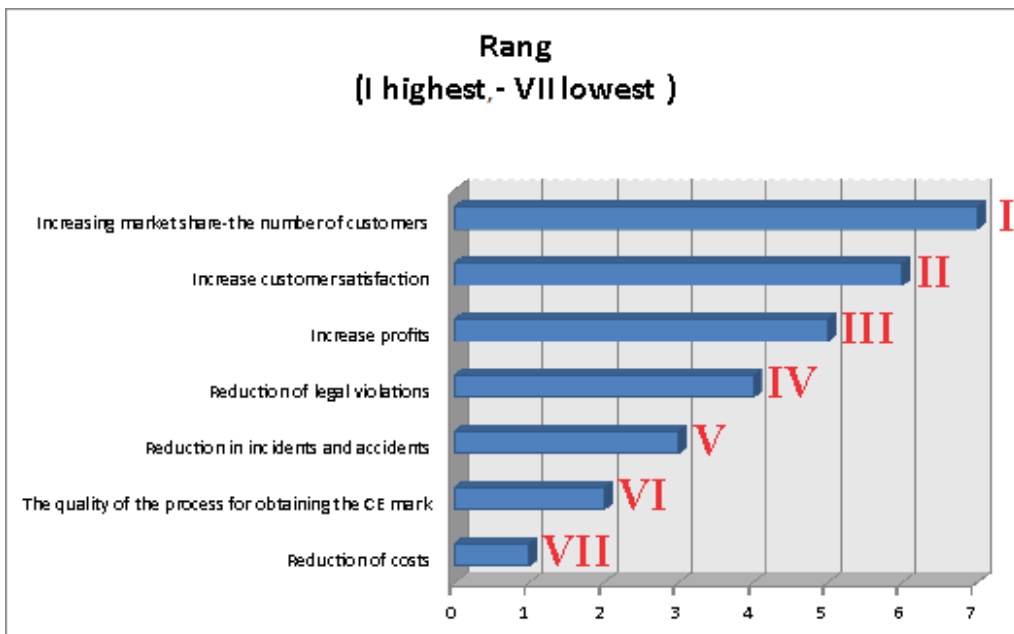
Figure 3. Goals of CE marking

6. Conclusion

Based on the results obtained by processing the questionnaires and shown in this work we can make next conclusions:

1) The results of the conducted survey indicates that necessary tests required for obtaining CE mark for 48% are done in laboratories outside our country. The reason for this is the lack of required

authorized laboratories in Serbia. By analysis we came to the conclusion that more than 80% of tests related to products of construction industry, were done abroad, because there are no authorized laboratories in Serbia. There is the same problem of medical products, but the percentage of products tested in foreign laboratories is smaller and it is 20%. Displayed results of the survey, as well as conclusions derived from the basis of experts experiences, confirm the hypothesis H1: the existing quality infrastructure in Serbia is not developed enough for the use of the new approach directives.

2) Analysis of the questionnaires comes to the conclusion that small organizations that are sertificated by some of the management systems, with a little investment, can obtain CE mark. The surveys show that nearly 50% of the tested organizations are sertificated by QMS, while some of them also have established integrated management systems. These organizations during the production of technical documentation for CE mark refer to the procedures QMS (development procedure, production procedure, procurement procedure...). More and more organizations choose integration process of obtaining CE mark and establisment

of the quality management system, before all, because of financial reasons . This proves the third hypothesis H2: organizations that established management system (QMS, OHSAS) with a little investment are ready for the use of the new approach directives.

Investment of resources in obtaining CE mark for products has a high rang of the cost-effectiveness. All companies as the main motive of obtaining CE mark for their products, specified export (100% of tested companies). The next reason for obtaining mark CE are customer requires (83.33% of tested companies). "The new " law on public procurement also motivated companies to the project of obtaining CE mark (as illustrated by he fact that one of the reasons - better " pass " on tenders led 66.67% of respondents). The medium evaluation to justify investment in mark CE is high and it is 8.48 (picture 4.4.9). The largest number of companies opted for the evaluation 9 (12 companies) and 8 (10 companies). The cost-effectiveness of the most numerous key products in relation to all products that participated in the survey is high (the table 4.3.3.). All of this represents the proof of the hypothesis H3: investment of resources in obtaining CE mark for products, has high range of cost-effectiveness.

References:

Arsovski, S. (2004). Integracija procesa uspostavljanja QMS i dobijanja CE znaka za mašine. *Kvalitet, 14*(1-2), 48-52.

Arsovski, S., & Kanjevac Milovanovic, K. (2009). Extended model of competitivity through application of new approach directives. *International Journal for Quality Research, 3*(1), 1-6.

Arsovski, S., & Kanjevac Milovanovic, K. (2008). Modeling the impact of new approach directives on competitiveness of enterprise. *International Journal for Quality Research, 2*(2), 85-92.

Arsovski, S., Raonić, D., & Punoševac, Z. (2006). *Studija infrastrukture kvaliteta i zaštite životne sredine u Šumadiji i Pomoravlju*. Kragujevac: Mašinski fakultet u Kragujevacu, Centar za kvalitet.

Haque, I. (1991). *International Competitiveness: Internaction of Public nd Private Sectors*. Washington, D.C.: World Bank.

Jačanje menadžmenta kvalitetom, sposobnosti i infrastrukture kvaliteta u Srbiji i Crnoj Gori („SCG-kvalitet"), Projekta EuropeAid/114680/D/SV/YU, 2004.

Kanjevac Milovanovic, K., & Arsovski, S. (2009, May). *Extended model of new approach impact on quality, safety and competency of product our enterprises*. 3rd International Quality Conference, Kragujevac.

Kanjevac Milovanovic, K., & Arsovski, S. (2010, May). *The impact of the new approach directives on competitiveness enterprises in Serbia*. 4th International Quality Conference, Kragujevac.

Kanjevac, K., & Milivojević, J. (2005, May). *Tehničke prepreke trgovini, direktive novog pristupa i CE označavanje*. Quality festival 2005, Kragujevac.

Popović, P. (2010). *Akreditacija i ocenjivanje usaglašenosti*. Beograd: Univerzitet Singidunum.

Porter, E. M. (1990). *The Competitive Advantage of Nations*. Harvard Bussines Review.

Porter, E. M. (2008). *O konkurenciji*. Beograd: Fakultet za ekonomiju, finansije i administraciju.

Porter, E. M. (1987). *From competitive advantage to corporate strategy*. Harvard Business Review.

Porter, E. M. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *Jurnal of Economic Perspectives, 9*(4).

Rosić, I. (2004). *Strategija regionalnog razvoja Srbije*. Kragujevac: Ekonomski fakultet u Kragujevcu.

Velloso, J. P. R. (1991). *International Competitiveness and Creation of an Enabling Enviroment*.

Katarina Kanjevac Milovanovic
University of Kragujevac
Faculty of Mechanical Engineering,
Serbia
kanjevac@kg.ac.rs