

THE IMPLEMENTATION OF A QUALITY MANAGEMENT SYSTEM: A CASE STUDY OF SERBIAN TRANSPORT ORGANIZATIONS

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Abstract: The aim of the following study is to analyze the quality of operations in local transport companies, which includes operations according to certain international, European and national standards and regulations. Special emphasis is placed on the research in the field of standards, quality system and the implementation of the ISO series of standards 9000 for road companies. The implementation of a Quality Management System (QMS) is essential for companies seeking competition on the international market. This paper presents the results of the research which was carried out in Serbia at the end of 2012 on the sample of enterprises by interviewing managers on quality culture as well as departments dealing with the quality system of the company. Interviewees are from the following companies: those that have introduced the ISO standards or other quality management system, companies that conduct consultations to introduce the system, etc. Although respondents ranked the quality management function as the second most important of them all, after the function of telecommunications companies, the research revealed that managers within transport companies in Serbia are insufficiently aware of the importance of introducing QMS for achieving better business operations. The research results within other services of surveyed companies show that this constitutes an unnecessary expense (for each company), and that the position of managers within these services is redundant. Thereinafter, the companies were ranked by their activities in the field of transportation, the number of employees and the type of organization.

Keywords: Quality Management System (QMS), transportation, traffic, implementation, ISO 9000, quality.

1. Introduction

Quality management is a systematic way of guaranteeing that the activities will be organized according to the plan drawn up beforehand. It is a discipline that deals with management control, ensuring prevention. Quality management is an effective tool for solving all quality requirements and establishing a modern and innovative company. It is a set of actions and activities

that affect the quality of products, work and organization (Fey and Gogue, 1994).

The introduction of a quality management system in a company leads to: a continuous and constant improvement, increased competitiveness, increased efficiency and profitability, clear procedures, reduction of errors, reduction of production time, better motivation, better communication and disclosure of information, improvement of

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the image, safety and reliability of products and services, better management of human resources, and most importantly, focus on customers. The varieties of methods are used for the efficiency evaluation of decision making units (e.g. public transport companies). It is very often used in the transport sector for the efficiency assessment of airports, ports, railways and public transport companies (Markovits-Somogyi, 2011).

A service user is the one who determines quality, not the manufacturer. Quality evaluation is necessary to know the needs of the user. The focus on the buyer indicates that the concept of quality is based on marketing. The significant research has done in this field by Terziovski et al. (1997) within the study which was developed in order to test the strength of the relationship between ISO 9000 certification and organizational performance in the presence and absence of a total quality management (TQM) environment. The analysis was done a large random sample of manufacturing companies in Australia and New Zealand. Furthermore, the study reported by Salomone (2008) has been developed using a sample of Italian companies to investigate the potential for integration starting from an analysis of the common aspects in terms of real motivations (company image, costs saving, etc.), obstacles (unclear regulations, lack of financial support, etc.), driving forces and external pressures that companies meet when implementing each of the management systems analyzed: Quality (ISO 9001:2000), Environmental (ISO 14001:2004), Occupational Health and Safety (OHSAS 18001:1999), and even, Social Responsibility (SA 8000:2007) management systems. Based on a comprehensive literature review, some studies (Kaynak, 2003) identify the relationships among total quality management - TQM practices and

examines the direct and indirect effects of these practices on various performance levels whilst other studies put forward a procedure for measuring the competencies that can be developed in association with a Quality Management (QM) initiative and analyzes the reliability and validity of the resulting scale (Escrig-Tena and Bou-Llugar, 2005).

In recent years, numerous approaches have been proposed to improve operations performance (Kannan and Tan, 2005; Lin et al., 2005; Tsai and Chou, 2009; Calingo, 1996; Lai and Cheng, 2003; Yusuf, Y., Gunasekaran and Abthorpe, 2004; Van der Wiele et al., 1996; Trienekens and Zuurbier, 2008; Hull, 2008; Salomone, 2008). Three in particular, just in time, supply chain management, and quality management, have received considerable attention and this paper is based on the last mentioned strategy.

2. The Importance of a Quality System

Quality management system is a wide area where many terms are used depending on the user experience and the environment which could be explained in many different ways. This is the reason why basic terms used in the quality system management are standardized and have a unique meaning.

ISO 9000 series of standards consists of standards and manuals which refer to the control system, terminology standards and resources which provide an overall explanation of that system.

The research presented in this paper was focused on the acquisition of quality culture by managers in Serbian transportation companies. The latest research shows that Serbian companies have not implemented the necessary reforms. However, there is the

will to set up a proper system according to the requirements of certain organizations (Table 1).

One of the goals of this study was to determine the relationship between those responsible for the introduction of quality in companies and their attitude towards the introduction and implementation, as well as to compare the results we obtained with those of the companies in the EU.

Some organizations only want to acquire a formal certificate, but forget that their documents have to meet the standards, which according to Montgomery (2012) is their "Achilles heel". Such organizations represent themselves falsely because the ISO 9000 certificate merely guarantees that there is a quality system which enables the production process of a product and/or goods and the provision of services in the way it is guaranteed to the customer or user.

Table 1
The Number of Certificates Issued According to the ISO Standards in Serbia

Year	Number of certificates
2002	65
2004	89
2006	142
2008	175
2010	187
2012	213
Total	871

Source: SORS (2012)

The results of the survey showed that the highest number of certified organizations can be found among transportation companies which compete to acquire the best possible position in the international

market as well as telecommunications, sea and inland waterway transport, road transport, and air transport companies.

International competition and the search for regular customers forces the company to accept the quality system as its business philosophy and strategy. Considering that Serbia is on its way to become a member state of the European Union, a dramatic increase in the number of certificates in the next few years is foreseen. The results of the studies conducted in Serbia show that there is a correlation between business success and the quality system.

3. Research Methodology

The research was based on a survey of a representative sample of companies. Companies from all fields of transportation, of different sizes (Table 2) and from different parts of Serbia were equally represented in the survey (Table 3).

Data were collected using computerized telephone interview CATI². General managers, directors of other sectors (if such a position exists), and members of the board were interviewed. The criteria used in selecting and grouping were: the size of the company and the transport sector of the company. This survey was undertaken in 2012. It focused on five issues: the importance of implementing QMS, informing employees about it, skilled personnel to perform quality, the attitude of employees to service QMS, the assessment of the success of implementation.

The survey contained over 550 companies, which were specialized in

² CATI (Computer-Assisted Telephone Interviewing) includes automatic data entry, as well as complete control of data entered. The market research agency Plus Ltd. collected the data using the software WEBCAT while the statistical software package SPSS was used for data processing.

different activities in the field of traffic, such as planning offices, transportation companies – passengers and freight, freight forwarding, road construction companies, airlines, companies providing telecommunications services, and companies providing logistical support. The unit of analysis within this study was a company and the unit tested was a CEO or a manager of the company.

Table 2
The Structure of Surveyed Enterprises by Size

Number of employees	Structure %
More than 250 (large enterprise)	25
51-250 (medium-large enterprise)	38
15-50 (small enterprise)	37
Total	100%

Source: SORS (2012)

Table 3
The Structure of Enterprises Surveyed by Region

	Structure %	
Region	Belgrade	34
	Vojvodina	16
	Eastern Serbia	14
	Western Serbia	4
	Sumadija	10
	Southern Serbia	5
Central Serbia	17	
Total	100%	

Source: SORS (2012)

4. The Results of the Research

4.1. The Acceptance of a Quality System

Out of 550 companies which were surveyed, 105 of them, that is 19%, have introduced a quality system, ISO or another one, while 14% received consulting for quality system implementation at the moment of benchmarking. Table 6 shows the total number of certified companies which were surveyed, the majority of them,

over 51% are companies engaged in international transport, and much less, 11% are companies involved in designing of roads, the so-called road construction companies, telecommunications companies 19%, transport enterprises which provide services only within Serbia 5%, and other transportation companies account for 23%.

Out of 183 selected companies whose business is mainly international transport (Table 4), over 29% had a certificate for some of the ISO standards, while 14% received consultations during the survey by a consulting agency. Transport activity was represented by 37 companies, of which less than 24% were certified, while 11% were following the procedure of preparation. Regarding other transport activities of those companies that were benchmarked, and whose operations were not specifically defined, but described as others, the sample was very small, less than 30, and the population was unknown, so the conclusion we deduced on them was not taken into account because it did not provide reliable data.

At the beginning of the inquiry, when each respondent was asked detailed questions about possible preparations for the implementation of the quality system so that senior management (directors) could reach a decision, a significant degree of preparation and consultation for the implementation of ISO standards was found in freight industry and other businesses that operate on the international market. Out of 550 companies, 54% had a positive view regarding the introduction of QMS, i.e. ISO standards in their business and the introduction of certificates, as 22% were currently in the process of preparations and 32% received consultations, while the rest of

the companies benchmarked were in some kind of boycott because they thought it was an unnecessary expense for them, not being part of international trends.

What is also evident in this sample is that out of 105 companies that have been certified as many as 65% are transport companies. The largest number of companies, as many

as 49% of them, belongs to the same group with an active attitude towards quality system according to ISO 9000. Only 14% had a poor attitude towards the introduction of certificates and these were mainly companies involved in some sort of traffic trade, the sales of finished products to road construction companies and alike (Table 5 and Table 6).

Table 4
The Structure of Enterprises Surveyed According to the Activities and the Implementation of the International Standard ISO

Main occupation	Number of companies	Structure %
Domestic transport of people	100	18
International transport of people	144	26
Road industry	63	12
Shipping	98	18
Logistics	30	5
Telecommunications	43	7
Road safety agencies	7	1
Design offices	3	1
Air transport	9	2
Rail transport of passengers and goods	53	10
Total	550	100%

Source: SORS (2012)

Table 5
The Number of Enterprises by the Types of Activities and the Implementation of the International Standard ISO

Number of respondents	Have certification %	Preparing for certification %	Other %
	105	75	370
International transport of goods	51	30	29
International transport of people	11	13	27
Container transport	10	20	15
Road Safety	1	5	13
Telecommunications	14	11	6
Road Industry- performers	7	5	5
Road Industry- design	3	3	2
Air Traffic	1	5	1
Logistics	1	3	1
Rail traffic and transport	1	5	1
Total	100%	100%	100%

Source: SORS (2012)

Table 6

The Structure of Enterprises Surveyed by Group Activities and the Implementation of the International Standard ISO

	Have certification %	Preparing for certification %	Other %
Number of respondents	105	75	370
Transport	65	49	49
Air transport	14	20	22
Telecommunications	18	26	18
Road industry	3	5	11
Total	100%	100%	100%

Source: SORS (2012)

4.2. The Implementation of a Quality System and Company Size

The results of the inquiry are presented in Table 7 and Table 8. It can be concluded that the size of companies and the implementation of quality systems are statistically dependent values.

The greatest number of certificates was awarded to medium-sized companies, as much as 41%, then to large companies,

about 33%, and finally to firms with 15 to 50 employees, 26%.

Out of 210 medium-sized enterprises 20% of them had certificates, and 12% were in the process of implementing the quality system. Out of 135 large firms, 26% of them had certificates and 18% of them were in the process of receiving advice. Out of 205 small businesses in the sample, 13% had a certificate and 14% of them were preparing for it after the consultations with certification bodies.

Table 7

The Number of Surveyed Companies by Size and the Implementation of ISO

Size of enterprises	Have certification	Preparing for certification	Other
15-50 (small enterprise)	27	28	148
51-250 (medium-sized enterprise)	43	25	143
More than 250 (large enterprise)	35	22	79
Total	105	75	370

Source: SORS (2012)

Table 8*The Structure of Surveyed Companies by Size and the Implementation of the ISO Standard*

Size of enterprises	Have certification %	Preparing for certification %	Other %
Number of respondents	105	75	370
15-50 (small enterprise)	26	38	40
51-250 (medium-sized enterprise)	41	33	39
More than 250 (large enterprise)	33	29	21
Total	100%	100%	100%

Source: SORS (2012)

4.3. The Reception of Quality Culture and the Types of Organization among Benchmarked Companies

According to many authors that deal with the acquisition of quality, standardization will be one of the deciding factors on which Serbia's integration into the European Union will depend. To that effect, this research which was carried out among transportation organizations aims to determine companies' willingness to impose standardization. Table 9 and Table 10 show how many companies depending on their type of organization have

introduced or plan to introduce a quality system or receive consultations regarding the introduction of a quality system.

Based on the sample and the results presented in these tables, 49% of certified companies are limited liability companies, while 50% are holding companies. Among those receiving consultations over organization type, Ltd. companies are more numerous, accounting for as much as 58%, while holding companies account for only 41% with respect to the total number of companies.

Table 9*The Number of Enterprises by the Type of Organization and the Implementation of the International Standard*

Type of organization	Have certification	Preparing for certification	Other
Ltd.	51	43	226
Holding companies	53	31	128
Other	1	1	16
Total	105	75	370

Source: SORS (2012)

Table 10

The Structure of Enterprises by the Type of Organization and the Implementation of the International Standard ISO

Type of organization	Have certification %	Preparing for certification %	Other %
Number of respondents	105	75	370
Ltd.	49	58	61
Holding company	50	41	35
Other	1	1	4
Total	100%	100%	100%

Source: SORS (2012)

4.4. The Importance of the Function Performed by Managers in the Company

We asked the managers to give us their opinion of and assess the importance of selected business functions in our economy.

In companies with a certified quality system, the telecommunications function received the highest grade point average of 3.3 (on a scale of 1 to 4), while the quality management was in the second place, which can be seen in Table 11.

Table 11

Average Scores of the Importance of Certain Functions in Companies with Different Levels of the Implementation of the International Standard ISO (from 1-Least Important, 4-Most Significant)

	Have certification	Preparing for certification	Other
Number of respondents	105	75	370
1. Telecommunications	3.30	3.17	3.34
2. Quality Management	3.07	0.97	3.10
3. Marketing	3.00	2.96	3.02
4. Management	2.96	2.96	2.92
5. Human Resources	2.95	2.73	2.92
6. Finances	2.87	2.64	2.84
7. Production and Operational Processes	2.87	2.69	2.90
8. Public Relations	2.71	2.69	2.77

Source: SORS (2012)

The same results were obtained when we were looking at the entire sample, when the results of the companies were included, that is, the managers of companies that have and those that do not have a certificate for a Quality System.

5. Conclusion

This survey which was conducted on a representative sample of 550 transportation

companies doing their business in different areas of transport and based on interviews with managers, boards and directors of those companies helped us determine the degree of the adoption of quality management systems.

Barring the fact that the majority of companies in Serbia have not introduced any of the above systems of quality according to the ISO 9000 (9001) standard, or any other, and judging by the results obtained, it can

be noted that the interest in the necessity of implementing the system of quality in transportation companies has not yet been “awakened” nor is there sufficiently developed culture in this respect.

Results obtained in this study reject the opinion of the majority of managers that there is the greatest demand for trained personnel who could implement quality systems in companies of all types. The largest number of interviewed executives feel that the expertise of the managers who are working on the quality system and quality management is extremely poor, actually the poorest compared to other sectors.

In the opinion of all interviewees, the best managers are those who are in the field of telecommunications, marketing and then other jobs, and at the very end are managers from other fields of transport.

Considering only interviewees from companies that are certified, ratings are similar, insignificant difference can be noted, therefore these ratings were not reprocessed. The contradiction lies in the result which shows that the respondents considered that in Serbia managers of other activities are more sought after than those dealing with the quality system. This led us to more data which revealed that managers involved in the implementation of quality systems are the most numerous and the most sought after in companies dealing with: human resources management, finance, marketing, organization and management, etc.

It was surprising that only 12% of the interviewed directors, managers, and members of senior management of certified firms in the field of transport

where the implementation of QMS is very important acknowledged to have a position in the business due to the introduced ISO standards and their work on the application of the standard, while the rest thought the standards were imposed regardless of the future quality of business operations of the company.

The survey results show that transport companies have a very small number of managers who deal with the quality system. Furthermore, companies show very little interest in obtaining or seeking consultations with respect to the introduction of QMS.

The worst situation is in companies that are located outside of Belgrade and in those which offer their services only to customers within Serbia. The fact that merely 11% out of 45 companies have a certificate of quality reveals a serious disagreement about the things which need to be improved in the future, and many will oppose the changes due to ignorance as well as major expenses necessary to implement QMS.

There are 81% of companies in the sample that did not introduce the quality system standard ISO (9000.9001), 17% of companies of all respondents did not even bother to think about its introduction. However, the overall situation is still promising, because according to the survey, 37% of the companies studied are actively preparing for the introduction of quality systems.

In conclusion, the results indicate lack of awareness about the importance of systematic and continuous development of quality culture, as well as the training of quality managers and sustainable QMS functions in international trade and for overall prosperity. The results we obtained,

given the spatial range of the research, can serve as a basis for research in other countries, especially in South-East Europe.

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