Zuzana Kapsdorferová[1]

Mária Kadlečíková

Emília Svitová

UTILIZATION OF QUALITY MANAGERIAL SYSTEMS IN BUSINESS ENTITIES IN THE SLOVAK REPUBLIC

Abstract: Current global trends force businesses to enhance their competitiveness via quality, innovations, leaning of production processes and shortening of production cycles, development of employees and satisfying of customer's needs. At the same time, the society demands from entities more emphasis on sustainable development, environmental protection, social responsibility and on other social aspects of the business. Many firms seek the ways how to master such important demands and gain the recognition on the market. One of the avenues how to achieve planned results resides in implementation of the Total Quality Management systems, which also provide grounds for reaching a status of reliable business partner. Presented research paper puts an emphasis on execution of research in order to find out about the situation with the status of implementation of the quality managerial systems in Slovak businesses as well as to recognize reasons and contributions of usage of these systems in their activities.

Keywords: Quality, Total Quality Management, Quality Managerial Systems, Process Management, Business Entities

1. Introduction

Since the second half of the 1980s, there has been acceleration in the dynamics of changes in the economy on global markets. Priorities have been quality, innovations, shorter production times, information and communication technologies, employee development, business culture, and direct focus on customers' needs, the so-called customer imperative. On the other hand, the society has been laying demanding requirements on businesses in order to support sustainable development, safety and environmental responsibility, social responsibility and social engagement. The instability of markets has become ideal business environment for those who were prepared. Well-prepared businesses have found new business opportunities in a fast changing environment. The success of a business depends on the dynamics, the components of the organization and their mutual relations. Businesses have been confronted, in this connection, with new realities of the economic cycle, product life cycles, in the structure and nature of competition. Fundamental challenges have appeared for businesses: constant changes in the environment, increase of uncertainty and risks of wrong decisions. These challenges, along with the increase of constant

---

[1] Corresponding author: Zuzana Kapsdorferová
email: zuzana.kapsdorferova@uniag.sk

competition confrontations, have enforced management of such kind that would not only react but also anticipate a new situation.

In the development of managerial thinking, the principle of complexity of quality management and the mutual interdependence of business subsystems have been stressed in the context of this phenomenon. Many businesses have found their way exactly in building total quality managerial systems in order to tackle these demanding challenges and company goals and to achieve the deserved success in the market and hereby to become a reliable and successful partner. Nestic *et al.* (2013) declare that the quality goals and objectives could be considered as part of the strategic goals and objectives. Identifying and defining strategic objectives and strategies of the organization are included in the strategic approach to managing manufacturing companies to a variable environment. Performance and quality measurement is an essential element of effective planning, improvement and control as well as decision making. Kafetzopoulos and Gotzamani (2014) stressed that in response, food companies have increasingly pursued quality management (QM) practices in recent years. Regarding of this fact an increasing number of food companies all over the world have been implementing quality and Food Safety Systems (FSS) in order to improve the quality and safety of their products and to witness the related benefits. Nowadays, the main Quality Management Systems (QMS) that are implemented by food companies are those in the International Organization for Standardization (ISO) 9000 series. The ISO 9000 series of quality management standards provides the framework for organizations to install a QMS following certain guidelines and leads to continually improved processes that satisfy customers' requirements. Zuurbier and Trienekens (2008) added that in the last decade many public and private standards on food safety and quality have been developed as a result of these developments. Currently, there is

proliferation of standards worldwide. One effect is that, in particular, companies from developing countries and emerging economies have problems to comply with these standards. Another important effect is increasing marginal costs of certification and accreditation, which also puts pressure on company profits in industrialized countries. The combined impacts of these effects ask for strategies to revalue the cost/effectiveness of the certification and accreditation system.

2. Methods

The goal of this scientific paper is to evaluate the level of a quality managerial systems in Slovak business entities and to offer an overview of implementation the international quality management systems applied in Slovak businesses. In order to achieve the set goal, data acquired in the period from 1993 to 2013 have been analysed. A questionnaire survey was conducted in Slovak businesses from August 2012 to October 2012. The main goal of the research was to identify the strengths and weaknesses of the implementation of quality management systems in selected business entities in the Slovak Republic. As many as 106 questionnaires in total were completed, 59 of which (56%) were filled in by join stock company representatives, 43 (40%) represented limited liability companies, and only 4 respondents (4%) were from public institutions. Considering the length of their economic activity, the largest group participating in the survey were respondents who have run their businesses for longer than 15 years (60 respondents, 57%). The second largest group were companies working 5 to 9 years (20 respondents, 19%) and then companies working 10 to 14 years (16 respondents, 15%). Companies working less than four years were represented by 10 respondents (9%). Considering the types of companies with regard to the final result, the largest share had businesses of primary production and processing companies (71

respondents, 67%), companies providing services (31 respondents, 29%) and public administration institutions that provide administrative and education services (4 respondents, 4%). Most respondents have been dealing with production and marketing of food products (61 respondents).

The following hypotheses have been examined.

Hypothesis 1: *We assume that there is a correlation between the size of a company and the change in employees' attitudes.*

Hypothesis 2: *We assume that there is a correlation between the size of a company and the length of the quality management system introduction.*

Hypothesis 3: *We assume that there is a correlation between the duration of the existence on the market and the number of introduced management systems.*

Hypothesis 4: *We assume that there is a correlation between the duration of the existence on the market and the problems in change of employees' attitudes.*

Hypothesis 5: *We assume that there is a correlation between the area of the specific business and the costs of quality management system introduction.*

When examining the relations and correlations between the quality characteristics, we applied the association and contingency analysis. The existence of correlation between the characteristics was analysed with the χ^2 test of independence whereby the hypotheses assumptions are as follows.

H$_o$: There is no correlation between the corresponding quality characteristics.

H$_1$: There is a correlation between the quality characteristics.

The test is based on comparison of empirical and theoretical frequency for each category of monitored characteristics. The testing criterion for the verification of the zero hypothesis H$_o$ will be calculated as follows:

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(E_{ij} - T_{ij})^2}{T_{ij}}$$

where:

r − number of categories of the first (line) character

c − number of categories of the second (column) character

E_{ij} − empirical frequencies

T_{ij} − theoretical frequencies.

Relation for the calculation of the theoretical frequency T_{ij}:

$$T_{i,j} = \frac{R_i * C_j}{n}$$

where:

R_i - sum of frequencies in the i line

C_j - sum of frequencies in the j column

n - total frequency.

The final values of the hypotheses are compared with the critical (table) value:

$$\chi^2_{tab} = (\alpha, (c\text{-}1).(r\text{-}1))$$

where:

α - level of significance.

We do not reject the H$_o$ hypothesis if the calculated value of the testing criterion $\chi^2 < \chi^2_{tab}$, where χ^2_{tab} is the table value found at (c-1) . (r-1) degrees of freedom. If $\chi^2 > \chi^2_{tab}$, we reject the H$_o$ hypothesis that means that we consider the characteristics in the chosen value of significance to be dependent. All calculations are performed with a 5% theoretical value of significance.

2.1 Current State of Quality Management Systems in the Slovak Republic

Quality management systems can be divided on compulsory and voluntary. Among the compulsory systems are those systems that have the nature of laws and decrees issued on the national or global level, or decrees

issued within specific industries or consortia. The most frequently applied compulsory quality management system in food industry businesses is the HACCP system that acts on the basis of the Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the Hygiene of Foodstuffs. This Regulation imposed to business entities the obligation to implement this food system within 36 months. The food industry businesses were obliged to use this system since 1 January 2000. In accordance with the requirement of harmonisation of legislation of the Slovak Republic with the EU legislation, the HACCP system has been incorporated into the Food Codex of the Slovak Republic. Voluntary management systems are based on voluntary engagement. One of the most frequently applied international quality management norm is the norm ISO 9001:2008.

Top managements of Slovak companies are aware, of importance of implementing quality management systems that is the reason why we can observe an increasing trend of introduction of international quality management systems in the Slovak Republic as well. The reasons for an implementation of quality management systems can vary. It can be the increase of management effectiveness, profitability growth, cost reduction, competition pressure, acquirement of a stable market position, increase of need for complex management systems, satisfaction of requirements of more demanding customers, or it can be the fulfilment of contractual requirements. According to the International quality standard ISO 9001:2008 in the Slovak Republic were certified more that 3475 institutions in 2009. Certificates of information management system according to ISO / IEC 27001:2005 were issued to 29 companies in the Slovak Republic until 2009.

Environmental managerial system (EMS) is a set of interrelated activities, which aims to constantly improve the environmental performance of the organization, respectively to adapt it to the changing condition of business and its surroundings. In 2012, 19 new organizations were certified by the EMS certificate, whereby the total number of organizations with certified EMS according to ISO 14001 has increased to 1,132 since 1996 in the Slovak Republic. Certified organizations are from the manufacturing sector, wholesale and retail trade and transportation. At least obtained EMS certification is from the construction sector, education and other activities.
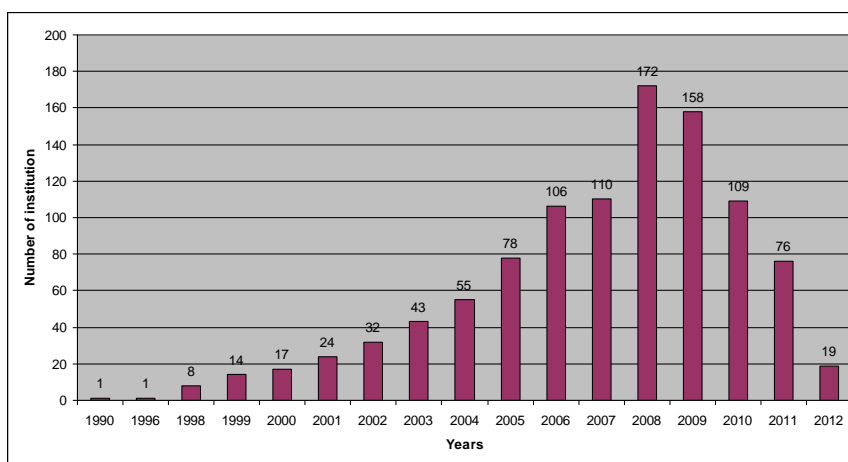

Figure 1. Development of the Annual Growth of Organizations with Certified EMS in Years 1990 – 2012 (Klinda and Lieskovská, 2013)

In order to recognize the use of quality management systems, the first question in the questionnaire was: *„Does your company implemented a quality management system?"* According to data from respondents, as many as 105 companies (99%) out of 106 examined companies have introduced at least one quality management system. One company (1%) which has been providing services has not introduced any certified quality management system so far but this company is at the moment implementing a quality management system in accordance with ISO 9001:2008. It can be said that the mentioned finding really documents and confirms the results of data obtained from national sources.

In analysed companies that have been working in the Slovak Republic, ISO norm 9001:2008 is the most frequently applied norm and this was mentioned by 99 respondents (37%), Figure 2. The second most frequently applied quality management system in Slovak companies is the norm ISO 14 000:2004 that has been certified in 59 respondent companies (22%). A high representation of 25% have quality management systems applied in Slovak food industry companies, specifically HACCP (25 companies), ISO 22000:2005 (13 companies), BRC (6 companies), IFS (22 companies) and other (GMP – 25 companies).
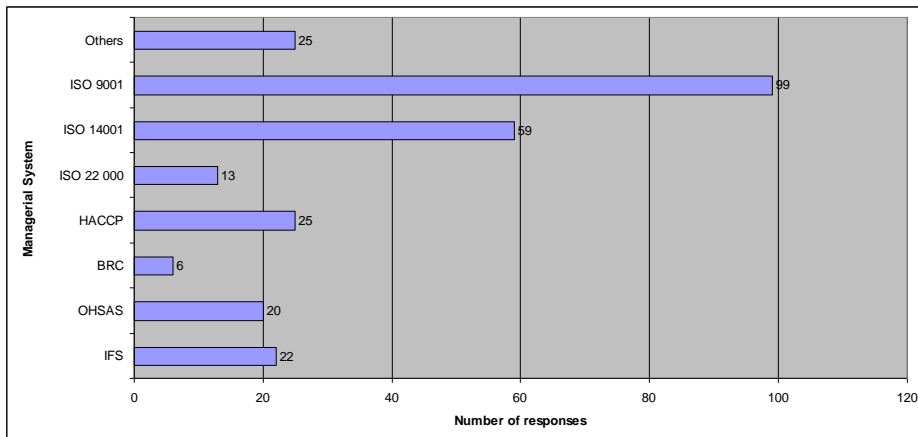

Figure 2. Selected certified quality management systems in analysed companies (Own research)

In connection with this question, the **Hypothesis 3** was tested. *We assume that there is a correlation between the duration of the existence on the market and the number of the introduced management systems.*

We tested the hypothesis:

H_0: *There is no correlation between the duration of the existence on the market and the number of the introduced management systems.*

H_1: *There is a correlation between the duration of the existence on the market and*

the number of the introduced management systems.

The results have shown that the calculated testing characteristic is higher than the table value. Following from the results of the χ^2 test (p = 154.530) on the level of significance = 0.05 we accept the H_1 hypothesis that claims that *there is a correlation between the duration of the existence on the market and the number of the introduced management systems.*

Slovak food industry businesses have a high share of participants in the survey and they

have applied various quality systems. Most frequently these are norms ISO 9001:2008, HACCP, IFS ISO 22000:2005, BRC and GMP. Following from the results of official controls carried out in food industry businesses by the State Veterinary and Food Administration of the Slovak Republic (Bíreš, 2012) a number of inconsistencies have been identified in using the system of correct production practice. In 2011, 22,603 businesses were controlled. In 1,859 of them, an inconsistency was found in the application of the system of correct production practice. The most violations were discovered in retail, specifically in 1,120 businesses. The most frequently found violations were:

- *in the documentation regarding the correct production practice:* individual operations connected to the production, manipulation and distribution of foodstuffs on the market following from the general hygiene requirements for foodstuffs production in accordance with the valid legislation were not implemented sufficiently,

- *in insufficient reports* about the implementation of the system how to secure the monitoring of food hygiene, lack of monitoring of CCP and violation of the plan of protection against pests,

- *in incorrect implementation of requirements regarding the hygiene of businesses* – the highest number of shortcomings was found in retail where as many as 5,551 out of 15,436 controlled objects had inconsistencies in the application of requirements regarding the hygiene of businesses. Found shortcomings were mainly insufficient hygiene of the business premises, dirty walls, and ceilings, dirty and damaged floors, worn and dirty technologies, moulds, window without protection against insects and doors against rodents, missing reports on

performed sanitation, the premises were sometimes not adapted to legislation requirements,

- *in shortcomings in the application of requirements regarding the personal hygiene* – neglecting the carrying of work clothes, unsuitable work clothes, dirty work clothes.

The main aim of official food controls is to check how rules and regulations are complied with, to eliminate shortcomings with regard to foodstuffs produced in the Slovak Republic and to prevent high-risk foodstuffs imported from third countries from entering the EU territory in order to protect the health of EU consumers. In the Slovak Republic, 26,684 food industry businesses were registered in accordance with the Food Law and 22,603 businesses were controlled, i.e. 84.33%. In 2011, 59,805 controls were carried out in these businesses in total. Out of the total number of controlled businesses, in 7,059 businesses were identified 11.80% shortcomings, Figure 3.

The most frequently identified shortcomings during official controls were shortcomings in overall hygiene (9,985), then food after expiration (3,787), followed by shortcomings in labelling of products (2,175) and shortcomings in the correct production practice (1,859), Figure 4.

It has to be said that quality management systems have had positive impact on the overall quality of foodstuffs offered to consumers, in spite of certain shortcomings.

According to the result of the consumer basket monitoring for the period 1993 – 2005 and the share of unsatisfying samples, the relation changed positively with regard to the consumer. The share of unsatisfying samples decreased from 12.3% in 1993 to 1.2% in 2005, while the number of controls increased, Table 1. Unfortunately, these data have not been measured in the Slovak Republic since 2006.
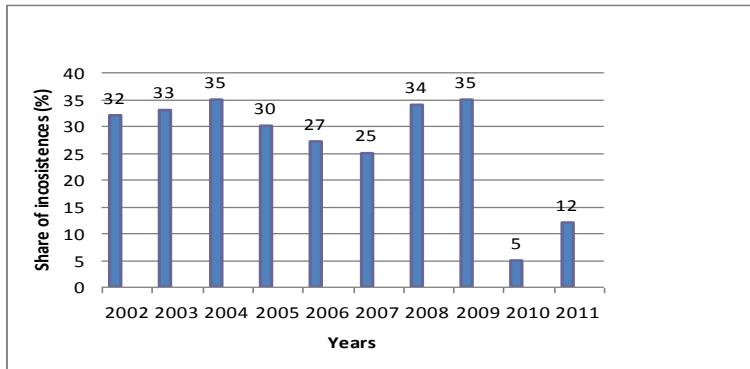
Figure 3. Share of inconsistencies out of the total number of controls in food industry businesses from 2002 to 2011 - Own analysis based on data from Bíreš (2012)
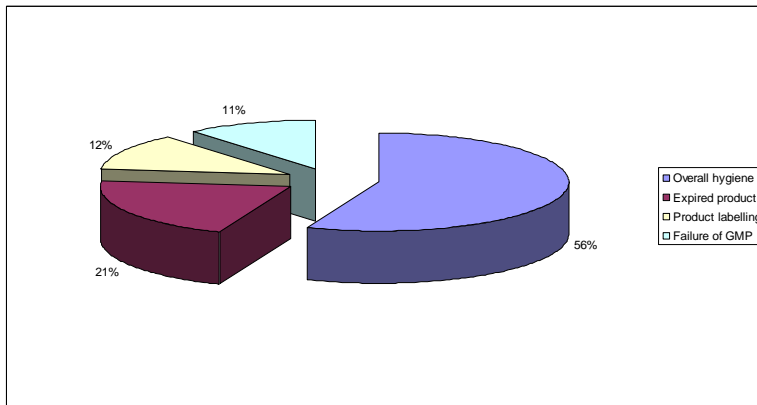
Figure 4. Share of identified shortcomings during official controls in 2011 - Own analysis based on data from Bíreš (2012)

Table 1. Result of the monitoring of the consumer basket in the period 1993 – 2005

YEAR	Number of samples	Share of unsatisfying samples (%)
1993	478	12.3
1994	655	7.5
1995	512	6.6
1996	657	3.4
1997	734	4.2
1998	775	5.6
1999	799	2.4
2000	635	1.1
2001	536	1.3
2002	462	0.1
2003	639	0.3
2004	679	0.9
2005	673	1.2

Based on the survey results, an important minority of benefits was evaluated with the Pareto chart after the introduction of quality management systems in a business. These benefits include: improvement of management, continuous improvement, measuring and economizing processes, definition of competencies and responsibilities, determination of main and supporting processes, qualification for customers and a better market image, Figure 5.
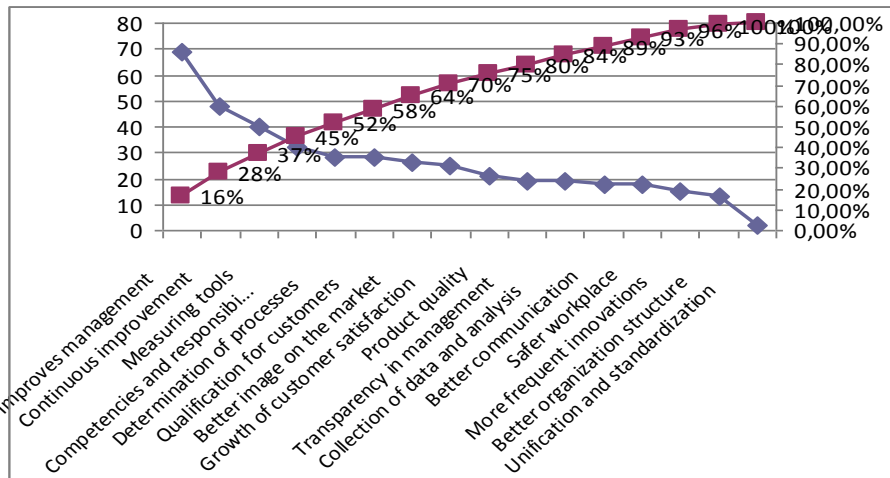

Figure 5. Evaluation of benefits with the Pareto chart (Own analysis)

Quality management is an area that does not include only the introduction of appropriate systems, processes, methods and techniques into the organization. But it is also an issue that is a part of overall cultural changes in the organization, whereby the change of culture in the sense of set goals is considered the key for a total quality management. In order to find out these data, the question was *"What were the biggest challenges for your company in implementing the management systems in the company?"* The aim of the question was to identify obstacles in the implementation of the quality management system in the company.

The biggest challenges in the implementation of quality management system are, according to questioned companies:

- processing the documentation (62 respondents, 33%),
- dealing with the change of employees' attitudes (50 respondents, 27%),

- financing (47 respondents, 26%),
- process measurement (13 respondents, 7%).

12 respondents (7%) stated that they encountered no problems in introduction of quality management systems, and no respondent said that training would cause any problems in the introduction of the system in the company.

A part of the analysis was the Hypothesis 4: *We assume that there is a correlation between the duration of the existence on the market and the problems in the changes of employees' attitudes.*

We tested the hypothesis:

H_o: *There is no correlation between the duration of the existence on the market and the problems in the changes of employees' attitudes.*

H_1: *There is a correlation between the duration of the existence on the market and the problems in the changes of employees' attitudes.*

It follows from the results that the calculated testing characteristic is higher than the table value. Based on the results of the χ^2 test (p = 12.757) on the level of significance = 0.05 we accept the Hypothesis H_1 that says: *There is a correlation between the duration of the existence on the market and the problems in the changes of employees' attitudes.* The correlation between the duration of the existence of the company on the market and the problems in the changes of employees' attitudes was confirmed. Based on the confirmation of the hypothesis, it is possible to conclude that employees prefer to uphold their usual attitudes and working habits.

It is very difficult to determine the time for the implementation of quality system in a company. It definitely is a long-term, lifelong activity regarding all specific aspects of the company. On the other hand, as far as the documentation of the management system in accordance with the ISO norms is concerned, it can be said that the optimal period of time is 6 weeks, whereby it is necessary to take into account the preparation for the certification process itself as well, that are further 6 to 12 weeks. The documentation and the evaluation of the activity of the company are based on the following principle: "Say what you are doing, and then do what you are saying that you are doing." The length of the introduction of the quality management system was specified by the respondents as follows:

- We introduced the system within 6 months   53 respondents (50%),
- We were introducing the system from 6 to 12 months   50 respondents (48%),
- We were introducing the system more than 12 months 2 respondents (2%).

In connection to this question, we analysed the Hypothesis 2: *We assume that there is a correlation between the size of a company and the duration of the quality management system introduction.*

We tested the hypothesis:

H_o: *There is no correlation between the size of a company and the duration of the quality management system introduction.*
H_1: *There is a correlation between the size of a company and the duration of the quality management system introduction.*

It follows from the results that the calculated characteristic is higher than the table value. Based on the results of the χ^2 test (p = 14.797) on the level of significance = 0.05 we accept the Hypothesis H_1: *There is a correlation between the size of a company and the duration of the quality management system introduction.* It follows from the hypothesis that larger companies introduce quality management systems over a longer period of time than smaller companies.

The next, fifth hypothesis was formed as follows: *We assume that there is a correlation between the area of the specific business and the costs of quality management system introduction.*

We tested the hypothesis:

H_o: *There is no correlation between the area of the specific business and the costs of quality management system introduction.*

H_1: *There is a correlation between the area of the specific business and the costs of quality management system introduction.*

The calculated characteristic is higher than the table value. Based on the results of the χ^2 test (p = 41.253) on the level of significance = 0.05 we accept the Hypothesis H_1: *There is a correlation between the area of the specific business and the costs of quality management system introduction.* That means that companies dealing with processing and retail activities invest more money into introduction of quality management systems than companies providing services and public administration institutions.

Based on the acquired data, we performed a comparison between companies and public administration institutions, and it follows from this comparison that the public

administration is behind in quality management systems, in the following points:

- *limited orientation of the approach to satisfy the customer needs –* as the satisfaction surveys are mostly performed only once a year and no results are concluded from them,
- *lack of own financial means to introduce quality management systems and process management –* as the costs for introduction of a quality management system are considerable, the public administration, that has only limited financial possibilities anyway, can use for only project money allocated for this purpose,
- *low awareness of process and functional management –* in public administration institutions, the focus on reasons leading to results is not so clear, nor is focus on specific results,
- *low financial motivation of human resources and insufficient evaluation schemes for employees –* has impact on performance but also on low number of implemented innovation proposals,
- *insufficient use of benchmarking when evaluating with other public administration institutions –* weak cooperation with partners on the same level, or lack of common project tasks.

3. Summary

The following characteristic of the application of total quality management in businesses in the Slovak Republic follows from the performed survey:

- The most frequently applied international quality management system in businesses in the Slovak Republic is the quality management system according to ISO 9001:2008. Businesses with a longer history have a higher number of introduced quality management systems.
- Benefits of quality management systems applied by examined companies included overall improvement and transparency of management, continuous innovations and improvements and measuring and economizing processes.
- The duration of implementation of quality management systems is, according to theoretical recommendations, about 6 months. According to survey results, 48% businesses comply with this recommendation. The survey confirmed that larger companies were introducing quality management system over a longer period of time.
- The most frequent reasons for introduction of quality management system in a company are competition pressure, certification of competence and reliability for business partners and necessity when applying in public or commercial calls for bids where the quality system ISO 9001:2008 is required in most cases. Up to 8% respondents consider a quality management system at present to be indispensable.
- The largest problems when introducing quality management systems in companies were caused by processing documentation and change of employees' attitudes. It was shown that those companies have a problem with a change of their employees' attitudes that are longer on the market. On the contrary, new and large companies have no problems with employees' attitudes.

- Almost all respondents stated that they cooperate on common projects with their business partners.
- The companies check the satisfaction of customers by market surveys, evaluation of complaints and with the help of customer audits. They analyse the satisfaction of customer needs mostly once a month. Companies that introduced more than one quality management system check the satisfaction of customers more often.

4. Conclusions

The results of the survey indicate the following characteristics of total quality management applied by business entities in the Slovak Republic:

The most common international quality management system applied by business entities in the SR is represented by the ISO 9001:2008-compliant quality management system. Entities that have been operating on the market for a long period of time have a greater number of implemented quality management systems. According to the ISO 9001: 2008 international quality standard, more than 3,475 institutions were certified in the Slovak Republic in 2009. Information management system certificates according to the ISO / IEC 27001:2005 norm were given to 29 companies in the Slovak republic up until the year 2009. An environmental managerial system (EMS) is a set of interrelated activities which aim to improve the environmental performance of an organization on a continual basis, adapting it to the changing conditions within the relevant business sector as appropriate. In the year 2012, 19 new organizations were given an EMS certificate and the total number of Slovak organizations with a certified ISO 14001-compliant EMS increased to 1,132 since 1996. The certified organizations operate in the manufacturing sector, wholesale and retail trade, and transportation. The smallest number of EMS certifications pertains to the construction sector, education, and other business activities.

References:

Bíreš, J. (2012). *Výročná správa a verejný odpočet za rok 2011.* Bratislava.

Kafetzopoulos, D. P., & Gotzamani, K. D. (2014). Critical factors, food quality management and organizational performance. *Food Control,40*, 1–11 .

Klinda, J., & Lieskovská, Z. (2013). *Environmental report of the year 2012*. Bratislava: Ministry of Environment of the Slovak Republic. ISBN 978-80-88833-63-5

Nestic, S., Stefanovic, M., Djordjevic, A., Arsovksi, S., & Stojanovic, S. (2013). An assessment and optimization of quality of strategy process. *International Journal for Quality Research, 7*(4). ISSN 1800-6450

STN EN ISO 9000:2006, Systémy manažérstva kvality: základy a slovník. Slovenský ústav technickej normalizácie, 2006.

STN EN ISO 9001:2009, Systémy manažérstva kvality: požiadavky (ISO 9001:2008). Slovenský ústav technickej normalizácie, 2009.

Zuurbier, P., & Trienekens, J. (2008) Quality and safety standards in the food industry, developments and challenges. *International Journal of Production Economics, 113*(1), 107–122.

Zuzana Kapsdorferová
Slovak Agricultural
University Nitra,
Faculty of Economy and
Management
Institute of Management
Trieda Andreja Hlinku 2,
949 76
Nitra
The Slovak Republic
zuzana.kapsdorferova@unia
g.sk

Mária Kadlečíková
Slovak Agricultural
University Nitra,
Faculty of Economy and
Management
Institute of Management
Trieda Andreja Hlinku 2,
949 76
Nitra
The Slovak Republic
maria.kadlecikova@uniag.sk

Emília Svitová
J&T FINANCE GROUP SE,
Dvořákovo nábrežie 8,
811 02
Bratislava
The Slovak Republic
svitova@jtfg.sk