UDC: 005.6
Original scientific paper
Receved March 29, 2022
Accepted: April 29, 2022
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RESEARCH OF THE INFLUENCE OF CONSTITUTIVE FACTORS OF TQM ON THE ENTERPRISE PERFORMANCE

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Abstract: *The focus of the enterprise strategy with TQM is maximal satisfaction of customer which can be achieved by superior quality supply and business performance which are reflected to the creating value for customers and business owners. The results of the research show a contribution of the TQM to the improvement of business performance, but this contribution varies in intensity depending on the type of performance and used criterions.*

Harmonization of a quality management system by ISO 9001 standards, which are based on principles philosophy of TQM (such a case is considered here), positively affects the operational and market performance of the company, with different intensity of the impact according to the size of companies and the industry sector. The impact of certification on financial performance is obvious and it always could be proofed.

One of the most important conclusion is that companies with cerifications of QMS by the requirements of ISO 9001 standards make an effort to improve the quality of business and have a higher level of implementation of TQM, so thay create greater benefits from certification as opposed to companies which have primarily motivation leading by marketing interests and requirements which could be competition and pressure of market impacted.

The basic factors of TQM are practicaly identified in the first decade of this century, and have become the basis for research to the degree of implementation and relationships between the elements of TQM and TQM as whole, and business performance. There is no strict guideline for selecting important factors and KPIs, but their different combinations depend on the skills of the choosing by researchers. Combinations of success factors of TQM could be: customer orientation, continuous process improvement, focus on employees and teamwork, global vision of the organization (first three are directly researched in this paper).

The considered example, by the model of transport-logistic services, is positioned in the supply chain frame.

The results are presented in tabular and graphic forms.

Keywords: *TQM factors, QMS, enterprise, performance, KPIs, supply chain*

1. INTRODUCTION

1.1. Thematic framework for research

The focus of the company's strategy with TQM is the maximum customer satisfaction that can be achieved by superior quality of supply and business performance, which is reflected in the creation of positive values for customers and business owners.

The impact of quality system certification on financial performance is obvious and can always be proven. One of the most important conclusions is that companies with QMS certified according to the requirements of ISO 9001, strive to improve business quality and have a higher level of TQM implementation, so that they create greater benefits from certification compared to companies that have primarily leadership motivated (as according to market demands, so marketing interests with different actions aimed at strengthening competitive advantage).

The basic factors of TQM were practically became the basis for research into the degree of implementation at enterprise and the relationship between the elements of TQM, TQM as a whole, and business performance. However, there is no strict guideline for the selection of important factors and KPIs, but just rather their various combinations whose choice and combining depend on the skills of the researcher.

Combinations of TQM success factors can be: customer orientation, continuous process improvement, focus on the employees and teamwork, and the global vision of the organization (the first three factors are directly explored in this paper). Analysis, formulation, evaluation and implementation of the strategy are equally important. The percentage of implementation failures can be very significant, at the level of 70-90%.[1]

Business strategy defines the way the organization will function in the market. The operational strategy concerns the basic activities through which products or services are realized and delivered. Business activities are broader and concern many processes, such as material procurement, production, inventory management, delivery, satisfaction of customers, emplozies and stakeholders etc. Therefore, the operational strategy focuses on reducing process costs and improving profits for the entire business.[2]

Overall performance is possible through precise coordination of business strategies. Strategic fit is a concept that emerges for strategies that must be effective. The results show that business strategy (with innovation and other competitive advantages) and knowledge management strategy (codification and personalization) have a significant and positive impact on business performance (Radosavljević, M., Radosavljević, Ž., 2015). Understanding the importance of strategic integration and its influence to business performance is essential, because the choice of different methods and other factors can affect the performance of the company differently, which can lead to different, often wrong, conclusions.[3]

The above considerations should show that the authors have considered everything that is relevant to this paper, which is treated as an example at the level of a model of transport - logistics services, that is positioned within the supply chain.

[1] Đuričin,D., Janošević,S., Kaličanin,Đ. (2013). Menadžment i strategija, deveto izdanje, Ekonomski fakultet, Beograd.

[2] https://thinkinsights.net/strategy/operational-strategy/(access:05.04.2022)

[3] MUHAMMAD SHAHID KHAN ET AL. (2020). THE MODERATING EFFECT OF STRATEGIC FIT ENHANCES BUSINESS PERFORMANCE: EMPIRICAL EVIDENCE FROM THE TELECOMMUNICATION INDUSTRY.

1.2. Review of research by other authors

The authors studied the literature and numerous examples at the case study level regarding the relationship between QMS, TQM, and enterprise performance. For example: Saraph, J.V., Benson, P.G., Schroeder, R.G. (1989), analyze instruments for measuring critical quality management factors; Flynn, B.B., Schroeder, R.G., Sakakibara, S. (1994), consider a framework for researching quality management and appropriate connectivity with measurement instruments; Powell, T.C. (1995), considers total quality management as a competitive advantage with appropriate empirical study; Milovanović, V. (2018), investigates the impact of overall quality management on business performance, at the level of hypotheses tested on a sample of 141 companies; Ahire, S.L., Golhar, D.I., Valler, M.A. (1996), considers the development and validation of structural TQM; Black, S.A. and Porter, L.J. (1996), specify the identification of critical TQM factors; Apprentice, S. (2022), processes data related to a survey conducted on the topic of supply chain quality research from the aspect of customer satisfaction, etc.

The authors worked on two projects and published corresponded monographs on the relationship between QMS, performance and TQM with special research on quality in terms of consumer satisfaction (Andjelković, M., Radosavljević, D., Tomić, R., 2022).

In this regard, the authors noted the need to setup a concept with possible rationalization in terms of constitutive factors (or groups of factors) TQM and their impact on the full implementation of TQM in an enterprise that achieves increased performance with such a level of TQM. That is why this research was started whic is going on.

2. KEY SUCCESS FACTORS OF OVERALL QUALITY MANAGEMENT

The key success factors of TQM, in the format now studied by the authors, have become the basis for empirical research on the relationship between the degree of TCM implementation and enterprise performance. Researchers, in their plans and analyzes, choose the proposals of a group of success factors in the logical combinations.

Research models focus on the key success factors of TCM and the individual significance of each of them, which is determined on the basis of previous empirical studies (Milovanović, 2018):

- Commitment of top management;
- Customer orientation;
- Relations with supplyers;
- Process approach;
- Timely information and analysis;
- Continuous improvement;
- Focus on the employees;
- Social responsibility.

Only a part of the factors that will be the subject of direct research by the author will be presented here.

a) **Commitment of top management.** Successful implementation of TQM depends on top management that determines values, goals and strategy in order to meet customer expectations and improve the performance of the company. A high level of quality needs to be always accompanied by the company's commitment to this goal, good communication, support and allocation of the necessary resources to improve quality. Performance evaluations need to have also the evaluation of managers and all employees, which should always be associated with the achievement of quality goals.

The general managers of the company translate the mission and vision (which are defined in the high-level corporate strategy) into concrete business strategies that make up the overall business plan.[4] Logically, the global vision of the organization is defined by dedicated top managers.

b) **Customer orientation.** This factor indicates the company's focus on meeting current and future customer needs, with increasing levels of customer satisfaction, always in line with changes in customer expectations. Companies can achieve a long-term competitive advantage if they are able to:

[4] https://thinkinsights.net/strategy/operational-strategy/(access:05.04.2022)

- give the quick responses to customer requests (with the implementation of new ideas and technologies);
- produce and deliver products and services that meet or exceed customer expectations;
- have anticipating new needs and wishes of customers and timely prepare to respond to these challenges correctly.

Customers should be regularly invited to cooperate in the process of product development and testing, initiating services, or innovating the range of products and services of higher quality level. The goal is to translate the most valuable customers into of partners, so that they participate in the creation of programs and the realization and distribution of profits (customers - shareholders). Indicators of the degree of customers satisfaction are possible to get by frequently research of customer expectations and the degree of their satisfaction, the transfer of information to managers, as well as the use of this information to make plans and assess the quality achieved. Hence, such relationship marketing is developed, which is used as a means of sales promotion, but also in relation to the affection, trust and loyalty of customers. Customers are often members of multiple loyalty programs. Loyalty programs are seen as an apriciate tool for creating a long-term, profitable relationship between suppliers (it can also be the level of retailers) and customers (with aim is based on customer satisfaction). It is noted that even today, customers do not give quite clear answers, because mostly they themselves cannot rationally explain the real reasons for choosing a product or service (Plazibat et al., 2016).

c) **Process approach with continuous improvement.** The main idea of the process approach is that the improvement of the performance of the company as a whole is achieved through the improvement and contribution of each individual process (typically through innovation, reorganization and reengineering). Process monitoring and statistical process control are important for detecting errors and their correcting in time, as well as for finding opportunities to increase process efficiency. There may be multiple operational strategies within the same company, but they need to be synchronized. The set of operational strategies (which have focus on the processes) usually includes additional strategies, such as

product development, conquering new markets, better performance in the existing market, customer engagement, etc.[5]

Variations in production, which occur due to the input of different basic quality, are reflected in the quality of finished products and services. Process management includes preventive and proactive approaches in order to reduce variation and improve product quality (Milovanović, 2018.). This includes that the most important involvement of all employees in the company, which is achieved by promoting and emphasizing the importance of quality, organizational learning, in accordance with specific motivation and incentives for employees (in terms of adopting proposals for their innovation and rewarding). Responsibility for quality applies to all employees in the company (and not only at the level of some organizational units, or directly to the control or quality assurance service), so that significantly increases the company's potential for continuous improvement quality and performances.

d) **Focus on employees and teamwork.** Companies with TQM view employees as partners and valuable assets, what that increases the possibility of achieving better performance. Employees are the main part of human resources, they are the bearers of human capital, which is the most potent component of intangible activity (Milovanović, 2018). Commitment to employees influence to them to accept their greater emotional connection with the company, and that employees show their greater willingness to realize the organizational goals of the company. TQM practices support a philosophy aimed at maximizing the effects of teamwork of the groups and teams, with the inclusion and empowerment of all constantly trained employees (acquire new knowledge but also skills necessary for the specific work process in which they participate), with a high level of organization and reward system for contributing to the improvement of performance in accordance with the improvement of integrated quality.

[5] Ibid;

3. COMPANY PERFORMANCE

Company performance, or business performance, must be viewed in the context of company strategy. Strategic management and business performance are inseparable. The assertion of performance (strategic planning, as a rule, has a positive impact on the company's performance) therefore refers to the macro aspects that need to be assessed, evaluated and analyzed (i.e. constantly brought to light accordance of strategic planning and company performance). Strategic planning that represents strategy in terms of its functions as an action taken by a company to achieve superior performance has been defined (Hill et al., 2004,5). The strategy defines the action to improve performance. Hence the view that strategy is defined (phenomenologically) as "a plan, a trick, a pattern, a position and a perspective" (Mintzberg, 1987).[6]

In our research, the goal was not to review the definition and meaning, but to link the strategic goals and performance of the company.

The performance of a company is traditionally associated with an increase in shareholder value. But, if the TQM is taken into account, it is clear that the performance is primarily related to customers (especially high-value consumers). Performance, at the level of social responsibility, can be measured by reducing the impact on the environment, improved of performance of health and safety at work, etc. TQM from the aspect of customer satisfaction (with the aim of increasing their satisfaction) is the subject of our research. Limited interpretation of performance is not good (eg financial performance) and is not fully relevant for assessing what the company has achieved and what it needs to do next to generate even better results.

Regarding enterprise performance research, KPIs (key performance indicators) were selected, according to the model of organization with implemented TQM. Otherwise, one of the obligatory KPIs is level of quality in the company. During the transformation of corporate strategy into quality strategy, a large number of accompanying problems appear, primarily of a practical nature (Arsovski, S., Marković, G., Dabetić, M., 2011).

Most often, the analysis of business flows is performed, and in particular, improvements in the company for a period of several years, data related to the results

[6]https://lucidmanager.org/management/strategic-management-and-business-performance/ (access: 03.04.2022)

are checked and analyzes are performed using the BSC (Balanced Scorecard). The Strategy Map of the organization contains business indicators based on financial reports (objects), to which KPIs of non-financial nature are added (with the creation of a network of their mutual connection with the importance of dependence and impacts). Based on the appropriate results of business performance monitoring through KPIs, it is possible to clearly identify which are the most important (critical) drivers of improvement to define the basis for business success management.

The analysis often uses "BSC Designer PRO" - software package,[7] in accordance with the 4 perspectives of BSC (basic form: finance, customers, internal processes and people). Within the perspectives, the results (achievement of goals), KPIs, goals and initiatives (as an action plan) are observed, in order to determine the overall performance of the company and confirm hypotheses about the existence of correlations between process management and overall quality. There are other variants ("Whirlpool" Co., has 5 perspectives to follow: people, total quality, customers, finance and innovation). For each of these areas, specific objectives are made (5 to 7 main objectives) as well as performance measures of the KPIs that accompany them. The Controller Akademie has a similar approach to the BSC system, but only 3 main areas are followed here: growth, development and profit.[8] These are indicators that need to be improved in an appropriate way in order to properly and responsibly manage business performance.

With "BSC Designer PRO" it is possible to prove how improving the performance of the process can affect the performance of the organization. Hence, simulations of process performance changes are often confirmation of some assumed significance of the impact on organizational performance is sought.

The strategy involves balancing the interests of all stakeholders in order to maintain business balance. Continuous performance measurement enables corrective actions to be planned and implemented at the strategy level in a timely manner.[9]

BSC and TQM, stand in such a relationship that it can be argued that they are perfectly aligned with TQM principles. However, the TQM does not explicitly show the transition from quality to financial success, so this is basically made possible through

[7] https://bscdesigner.com/kpi_designer_manual/kpis.htm (access: 06.04.2022)

[8] http://mcb.rs/recnik/bsc-balanced-scorecard/ (access: 06.04.2022)

[9] Niven, R.P. (2003). Balanced Scorecard step-by-step, Publishid by John Wiley & Sons, Inc.

the BSC (BSC can show what kind of reorganizing the principles what TQM should be accepted). The BSC also improves the effectiveness of the TQM program by first identifying those internal processes for which improvement will be critical to the success of the strategy achieved through TQM (however, the TQM impact cannot be explicitly seen in financial performance).

BSC and TQM do not always coincide, because the transition between quality to financial success does not always happen. Some US Malcolm Balridge Award winners were obvious examples of good treatment of TQM principles, but still experienced financial difficulties. Namely, firms that focus exclusively on quality and internal process improvement usually do not link all operational improvements to the expected outcomes in the perspective of product buyers or service users. The advantage of the BSC is that all key links must be explicit.

The BSC is based on five principles that serve as the basis for integrated strategic management. Each of these principles focuses on critical issues concerning:

1. Introduction of changes;
2. Transforming the strategy into operational goals;
3. Coordination of organization and strategy;
4. Transforming the strategy into specifying the jobs and responsibilities of each employee;
5. Transforming the strategy into a continuous process.

Strategic planning affects performance, as investigated (Miller & Cardinal, 1994), (Rogers et al., 1999), primarily from the aspect of identifying the existence of a positive correlation between strategic planning (with quantified goals) and firm performance. It was concluded that more formal strategic planning affects the improvement of business results.[10] Further, according to the same source, it is argued that there is a positive correlation between the scope of formal strategic planning and a company's financial performance (Miller & Cardinal, 1994). This authors concluded that planning has a positive effect on growth and profitability, with a moderately positive correlation. Correlations show, in different cases, a significantly large fluctuation ($0.30 < r < 0.71$) but are sloaped towards positive performance.

[10] Ibid;

Based on our brief but focused review of strategic planning and its relationship to performance, it is clear that it is necessary to introduce some parametrically defined quantities (which are represented at the level of variation), and in this sense it is proposed to include TQM (then all can be cleared).

At the level of a special example, as shown in point 4, it will be possible to see the relationship between TQM and performance, in accordance with the set and achieved goals and plans of the company. The idea of the author is to present the results of the research in an obvious way, suitable for practical solutions to this type of problem in companies, without excessive theorizing and expanding the topic (remaining within the specified thematic framework). Here, to the readers, it was given only complementary references, e.g. (Cohen and Cohen, 1983), (Jaccard et al., 1990), (Venkatraman, 1989), (Baron, R.M. and Kenny, D.A., 1986), (Ahire, S.L., Golhar, D.Y. and Waller, M.A., 1996)[11], (Andrews, K.R., 1971), etc.

4. EXAMPLE

The paper gives a brief overview of the BSC, which is used by companies to connect financially with non-financial goals, as well as external perspectives (finance and customers) with internal perspectives (people and processes). The term "balanced" means that all 4 areas are mutually consistent (finance, customers, people, processes), but many companies in practice often give them different importance (greater or lesser) in terms of priorities in some of their business areas. Aspects related to customers, employees and processes are considered here (their are important for both, TQM and BSC), but, due to the lack of interviews with top managers and insight into specific financial documentation (or a situation that managers could realistically present), it has not been possible to consider aspects which concerning "commitment of the top management" (TQM) and the "finance perspective" (BSC).

Here, the basic aspects regarding the quality of supply chains are considered through the assessments and attitudes given primarily by customers and consumers. For the purposes in question, a Questionnaire was launched, on the basis of which answers

[11] Ahire, S.L., Golhar, D.Y. and Waller, M.A. (1996). Development and validation of TQM implementation constructs, Decision Sciences, Vol. 27 No. 1, pp. 23-56.

of interest for the subject were obtained (Šegrt, 2022a). As part of the same survey, the views of respondents at the level of the extended group were collected and processed (practically at the level of all represented categories of participants regarding supplying, production and delivery of products and services), according to (Andjelković, M., Radosavljević, D., Tomić, R., 2022). Theoretical bases of analysis, as well as a database with detailed answers of respondents) are contained in FPSP monographs that consider the problem of economic optimization and TQM at the level of supply chains (transport and logistics service systems).[12]

The questionnaire-2 was emphasized, which refers to "Research on the correlation between the performance of supply chains, the implemented TQM and customer satisfaction". Particular emphasis was placed on the aspects related to attracting a larger number of customers, ie users or consumers, with an increase in consumer satisfaction and an increase in the total volume of realized transport and logistics services.

4.1. Hypotheses [13]

The hypotheses are given according to the research described in detail in the monograph.

Hm (Main Hypothesis): The success of supply chains (SC) depends on the quality of service potential and the quality of the service process with a high level of customer satisfaction.

Auxiliary hypotheses:

1. **H1:** Alternatives at the level of transport and logistics arrangements contribute to improving the quality of supply chains.
2. **H2:** Ancillary services contribute to improving the quality of SC.
3. **H3:** The higher level of integral quality of SC attracts a larger number of customers / users and increases the total volume of realized transport and logistics services.

[12] FPSP (projekti: P1- Ekonomska optimizacija transportnih sistema na nivou lanaca snabdevanja; P4- Unapređenje totalnog kvaliteta digitalizovanih transportno-logističkih uslužnih sistema, 2022);

[13] Ibid;

4.2. Summary evaluation of the survey

The summary assessment regarding the quality of supply chains by customers / users is detailed in (Apprentice, 2022a). Only the processed summary results and the corresponding output indicators will be given here. The direct dependences of performance, TQM and individual TQM factors are shown in the form of diagrams.

The scale with the appropriate grades is set in the interval 1 to 5 (1-Absolutely irrelevant, 2-Essentially irrelevant, 3-Not important nor irrelevant, 4-Important, 5-Absolutely important). The frequencies for the respondents' grades, in accordance with the corresponding table (Šegrt, 2022a), are given at the level of aggregate data, Figure 1.

If all essay answers to the survey questions are converted into numerical values, the following is obtained, according to (Šegrt, 2022a):

- The expected mean value of the parameter evaluation (answer to the question) in this case is:

$$\bar{x} = \frac{\sum x_i f_i}{n} = \frac{4821}{1186} = 4{,}06$$

- Variance:

$$\sigma^2 = \frac{\sum f_i x_i^2 - \frac{(\sum f_i x_i)^2}{N}}{N} = \frac{20339 - \frac{(4821)^2}{1186}}{1186} = \frac{20339 - 19597}{1186} = \frac{742}{1186} = 0{,}626$$

- Standard deviation is:

$$\sigma = \sqrt{0{,}626 =}\ 0{,}791.$$

Taking into account the answers in the survey to the 22 questions asked (for customers-users of SC), it can be stated that the total expected mean value of the parameters of the random sample of the population is 4.06.

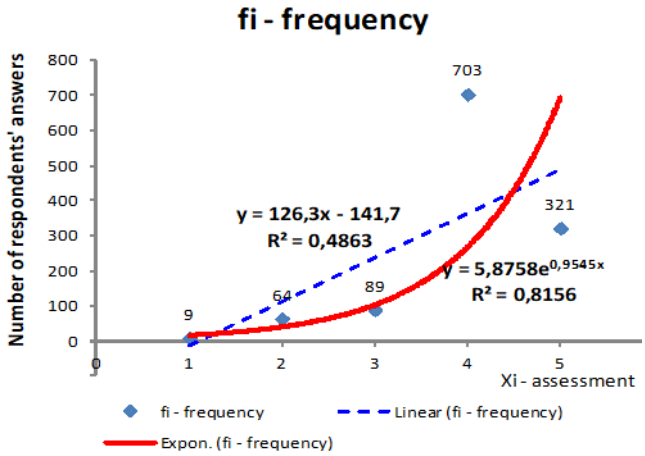

Figure 1. Diagram with the frequency of respondents' grades
(Source: authors)

Out of a total of 1186 questions asked regarding certain factors of interest for improving the quality of supply chain services and customer satisfaction, respondents gave 1024 answers or 86.3%, that they are important or absolutely important.

The obtained summary results of the statistical analysis of the survey, and taking into account the low level of standard deviation (0.791), as measures of deviation of individual responses from their mean, suggest that the main and auxiliary hypotheses can be accepted as correct. It is because of the absolute majority sample gave the answer in the survey was that the offered factors of interest for improving the quality of supply chain services and customer satisfaction are important or absolutely important (Šegrt, 2022).

4.3. Statistical analysis

The main statistical analysis is focused on the results of research on the relationship between TQM - QMS and company performance, in terms of different quality parameters.

The response from the field was satisfactory. Sufficiently good data have been obtained for their translation into final results, on the basis of which relevant analyzes should follow.

There are already basic statistical results based on the answers of the respondents to the questions from the Questionnaire - Survey that can be used in such a source form. The aim here is to group certain results according to groups of logically related questions/answers, as well as at the level of all questions from the survey, and to establish appropriate correlations and other relationships related to QMS/TQM status and forecasts whether TQM is going well (optimal) on the path from QMS to the full implementation of TQM (through TQM the company works much better - achieves maximum performance).

Regarding the derived results, and the benefits from them, the key analyzes are given in the corresponded appendix, report according to (Šegrt, 2022).

Here is a part of the analysis that cumulatively represents the parameters and relationships at the level of different quality systems in accordance with the set research frameworks. Based on the considered subject aspects of the quality system (QMS, TQM) and analyzed the relevant data from the tables (contained in Annex P3 of FBSL-Monographs), diagrams and other indicators were obtained that support the sustainability of the hypotheses and give an obvious picture of the relationship between QMS and TQM (according to basics at the level of comparison of TQM and QMS).[14] In the monograph itself, a number of appropriate summary diagrams are given with clear indicators of interest for a closer interpretation of the achieved results of the monograph, in more detail in (Šegrt, 2022).

[14] Faculty of Business Studies and Law (P4- Improving the total quality of digitized transport and logistics service systems, 2022);

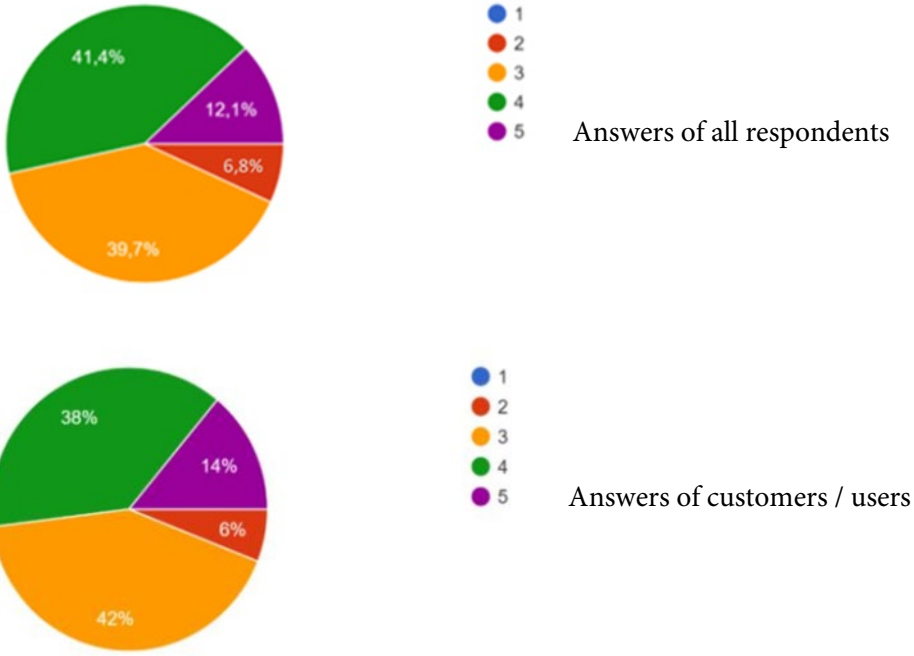

Figure 2. Quality assessment of SC given by:
a) - all respondents and, b) - customers/users
(Source: authors)

Analyzing the relationship between TQM (which was created as the upgrade of the already implemented QMS) and the actual-documented QMS according to which the company operates, where in both cases it was important to determine the company's performance (through the performance of enerprise with QMS and TQM, and their relation and consent), certain results were obtained which are shown in the graphs and with comments as in the pictures that follow. Explicitly stated aspects of quality (although it is practically impossible) are conditionally treated here at the level of an independent project "quality system" (hence the parameter "aspects of quality" appears).

4.4. Results of descriptive statistics

When researching the interrelationships of two variables, the methods of simple regression and correlation analysis are applied, and in the case of observing several variables, then the methods of multiple regression and correlation are used. The word "simple" only means that these are two phenomena, and by no means that the analysis is simple.

In accordance with fig. 3 (as well as according to the calculated correlation), it can be noticed that TQM and QMS do not have a high level of agreement of the results (correlation of 0.3186 means that it is a positive linear correlation of medium strength; the range 0.25 - 0.64; according to some authors this would be weak correlation[15] where the range is: 0.21-0.40). It could have been clearly expected, since in a significant part of the concepts there are certain differences between QMS and TQM (strong leadership versus employees and teamwork, product and service orientation versus customer orientation, orientation to a high level of standardized work versus continuous improvements), with a strong global vision of the organization with TQM. Nevertheless, the QMS quality management system should be understood as a path to TQM.

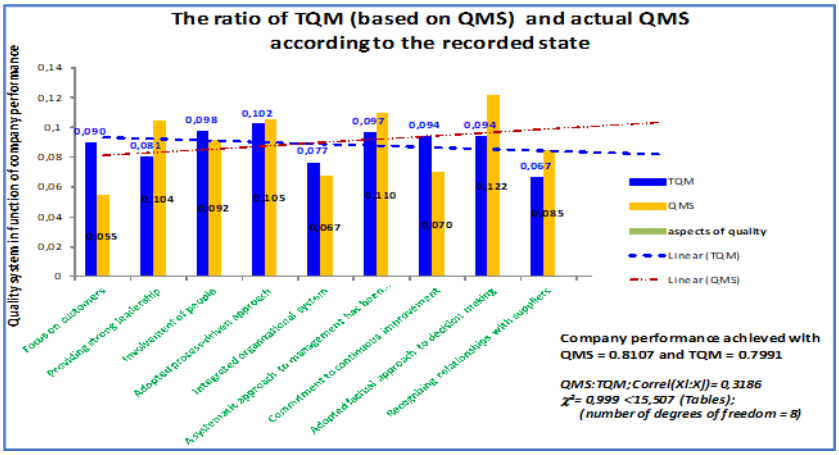

Figure 3. Basic aspects of QMS and TQM quality at the system level
(Source: authors)

[15] (Guilford, 1978), (Evans, 1996): Value of correlation coefficients with interpretation;

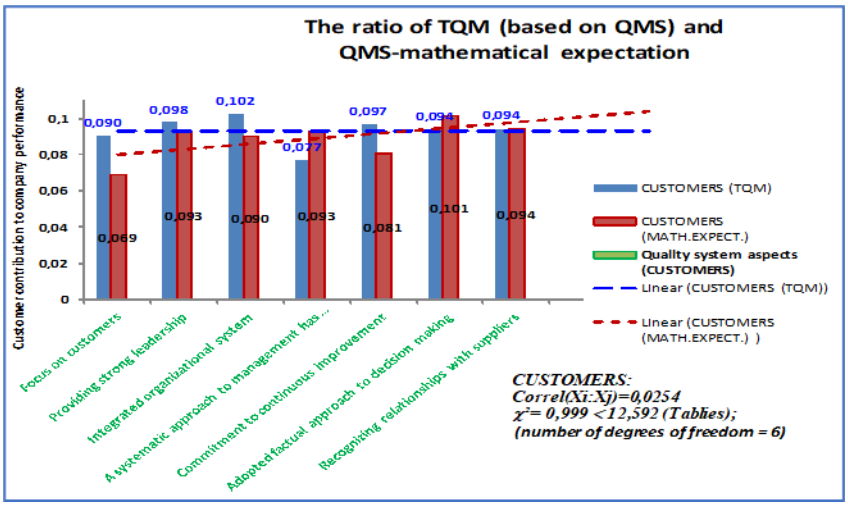

Figure 4. Quality aspects of QMS and TQM with special reference to customers/consumers (Source: authors)

Today, it can be stated that the evolution of quality management (QM) development is based on a new approach, primarily in terms of deepening knowledge for quality (from QMS, through TQM, BE and E, IQDM[16] to the body of knowledge for QM), according to (Majstorović, 2009).

Numerous analyzes have shown that the best approach is the simultaneous application of QMS / TQM, just when the organization realizes the greatest benefits, ie. much better than at the beginning when QMS or TQM are introduced and when applied separately.[17] It can also be concluded that there is a positive and dominant impact of TQM on the quality of products with innovative content. Conclusions according to the performed analyzes (Majstorović, 2009) can be identified as:

- QMS good practice has a positive impact on various aspects of an organization's business performance (from sustainable development to innovation), and vice versa;

[16] IQDM - Integrisani model podataka kvaliteta za podršku svim procesima, podprocesima i aktivnostima kvaliteta tokom životnog veka proizvoda

[17] Cerović,B. (2004). Ekonomika tranzicije, Ekonomski fakultet, Beograd.

- The paradigm of good practice in Republic of Serbia was also confirmed, ie. that the good practice of QM(S) in our country has had a significant positive impact on the overall business performance of organizations (Majstorović, 2009).

Due to the way in which companies work, with implemented QMS and TQM (and in accordance with the assessment of appropriate achievements), the results based on correlations of factors (customer, processes, employees) are logical, more precisely in these cases, for TQM and QMS, there is practically always positive linearly very weak correlation (r = 0 do 0.20), or it can be negative linearly very weak correlation (r = -0.20 do 0), as in the case of the factor "employees" due to the different way of working, training and the applied system of motivation and rewarding).

Below are diagrams that confirm the obtained assessment of quality systems at the level of supply chains. In accordance with the comparison of the results shown in Figures 8.9 and 8.10, the data as in Table 1 were established.

The ratio of the values of the QMS and TQM quality system indicators, based on the individual answers of the respondents (Fig. 7) and on the basis of the cumulative answers of the respondents (Fig. 8), helps to understand the results from Table 1 in a more obvious way.

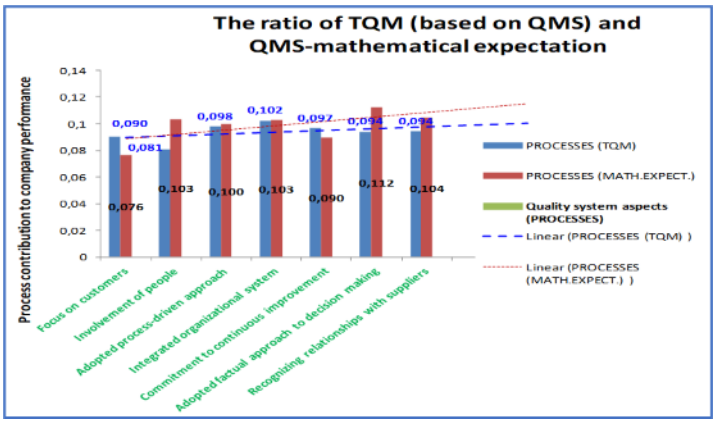

Figure 5. QMS and TQM quality aspects with special reference to processes (Source: authors)

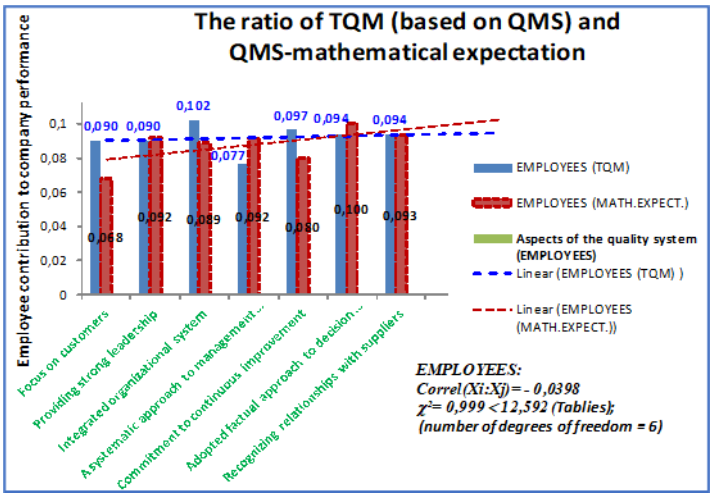

Figure 6. Quality aspects of QMS and TQM with special reference to employees (Source: authors)

Table 1. Functional dependencies - applied Excel functions

Functional Dependencies (Excel Functions)	Value	Assessment
CORREL(QMS; QMS/TQM)	0,992148627	Excellent positive correlation [0.85-1.00]; Individually (Answers to 10 questions: Answers to 22 questions)
CORREL(QMS; QMS*)	0,578912618	Positive middle correlation [0.40-0.75]; Individually: Cumulative (Answers to 10 questions)
CORREL(QMS/TQM; QMS/TQM*)	0,695796583	Positive middle correlation [0,40-0,75]; Individually: Cumulative (Answers to 22 questions)
CORREL(QMS*; QMS/TQM*)	1,00	Excellent positive correlation [0,85-1,00]; Cumulative (Answers to 10 questions: Answers to 22 questions)
CHITEST(QMS; QMS^)	*0,939695493*	Individually (Answers to 10 questions); Tables (p=0,05; r=3)=7,81472776; Accepted because it is 0,939695493<7,81
CHITEST(QMS/TQM; QMS/TQM^)	*0,92645049*	Individually (Answers to 22 questions); Tables (p=0,05; r=3)=7,81472776; Accepted because it is 0,92645049<7,81
CHITEST(QMS-TQM; QMS-TQM^)	*0,833160675*	Overall individually (Answers to 10 questions); Tables (p=0,05; r=3)=7,81472776; Accepted because it is 0,833160675<7,81
CHITEST(QMS-TQM; QMS-TQM*^)*	*4,73567E-25*	Overall cumulative (Answers to 22 questions); Tables (p=0,05; r=4)=9,487729037; Accepted because it is 4,73567E-25<9,49

(Source: authors)

It is logical that, with strong models of quality systems according to some of the above ISO standards (or SRPS ISO, eg SRPS ISO 9001), organizations work and achieve good business results (through the supply of quality products and high repeatability services), so it remains the dilemma of understanding the extent to which the TQM concept is accepted with changes in the culture and behavior of employees (in certified organizations) when it comes to achieving optimal quality (at the level of integrated processes) with a focus on the customer satisfaction.

The authors are aware of the fact that it is necessary to set plans far more ambitiously and conduct research on the subject category, so only data that can be compared with the achieved average value for QMS (QQMS = 8,277) will be presented, which refers to the average score given by respondents regarding the presence of TQM culture and the introducing of the concept of total quality, as shown by QTQM = 7.30 (excellent grade is conditionally taken as Q * = 10; the appropriate scale is set in the interval 1 to 10).

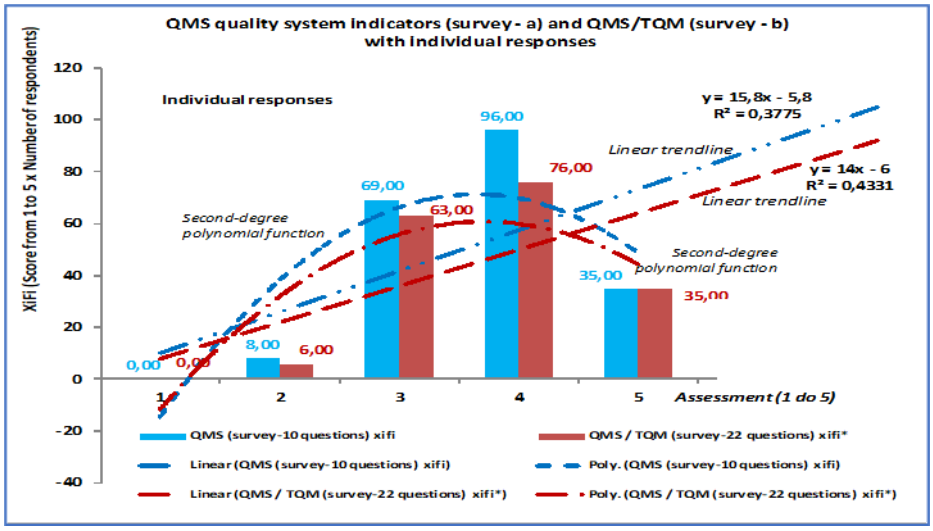

Figure 7. QMS and TQM quality system indicators based on individual responses of respondents (Source: authors)

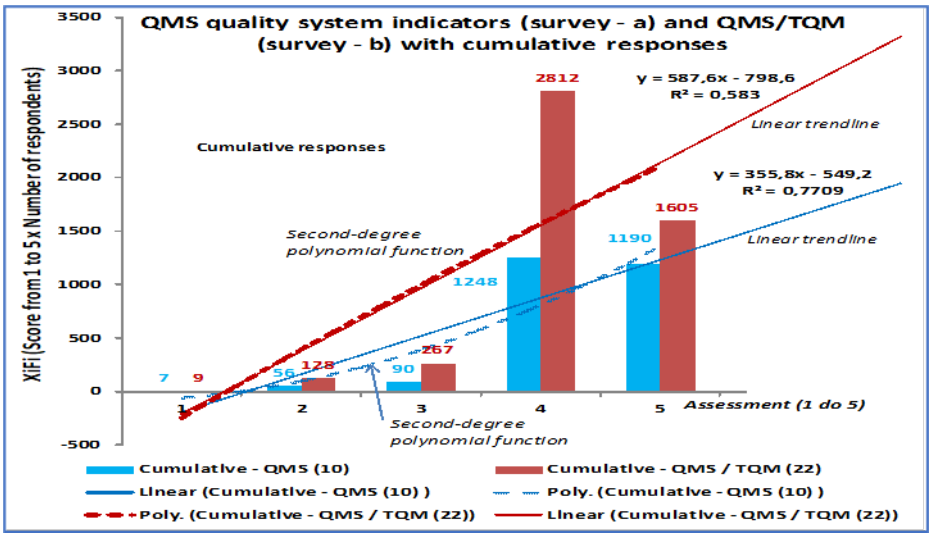

Figure 8. QMS and TQM quality system indicators based on cumulative responses of respondents (Source: authors)

CONCLUSION

Based on the previous analysis, it can be concluded that the key success factors of TQM, in accordance with the systemic interaction, will lead not only to increased customer and owner satisfaction, but also to improve the quality of deliveries of products and services at company with implemented QMS.

Since the implementation of TQM is a complex and continuous process of change, it is necessary to define an appropriate plan for measuring the progress of this process, which is achieved through performance measurement (in accordance with KPIs and appropriate tools). It must be emphasized here that non-financial performance measures are gaining in importance, with the help of which it is possible to timely assess the effects (in the early period of the business) and their connection with the performance of the company. Also, measuring performance is an integral part of TQM as it continuously achieves the goal of improving the process, quality and business of the company, which is not limited by anything (especially regarding the deadlines for final deliveries).

Everything that takes place on the basis of TQM, and its impact on the company's operations, needs to be documented and managed with such data and information. The documented data management system concerns complete processes in the company (better said at the company and environment level), from providing the necessary inputs in the form of data derived from measuring the performance of the supply process, through employees (their training, teamwork and satisfaction), and finaly to the delivery services and products (with after-sales support).

These data is significant because of quality, of the realization of plans, but also about the causes of quality problems, ie that on the other hand everything that has been identified should be objectified (as much as possible quantified, assessed and evaluated), and for definning of possible directions for necessary improvements. Improvements do not happen by themselves, and they are necessary not only because of technological and business trends, but also because of the perception of constant innovation of consumer demands, and of course because of building a more competitive market position of the company - supplyer.

The concept and importance of performance measurement, performance measurement systems, performance measures and appropriate tools, BSC perspectives, etc., will be the subject of research by authors in future projects and publication of the papers on subject topics, ie. regarding the research and definition of advanced models for identifying the correlation of achievements and trends in the development of quality systems (especially TQM) as a means to improve the overall performance of enterprises.

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