Implementation, development and evaluation of quality management system in selected companies

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Abstract
In the increasingly competitive market it is necessary to continually find ways to improve their own competitiveness. One of the crucial factors of competitiveness is the quality of the manufactured products and services. Quality as the compliance with the requirements of the customers should therefore be the focus of each company because it crucially affects customer satisfaction, loyalty, and the end result is the prosperity of a company. Quality management as a summary of approaches to quality management has undergone many years of development from a simple inspection of the product through quality control of the product, later through quality assurance already committed to preventing defects to complex quality management that fundamentally changing the way the companies in all areas are being managed. Customer demands for quality are reflected in the prices of individual products or services. Each producer must ensure its products having not only the appropriate level of quality but the quality must be also continually assured and demonstrated in the long run. It is important to note that the quality management system nowadays is not a luxury matter but a necessity and it must be said that the introduction of such a system does not automatically improve the company. It is a long process that would ultimately lead to improving customer satisfaction and stakeholder efficiency, to lowering costs, reduced risk, increased productivity, clear identification of responsibilities and of course last but not least to the improvement of the product quality itself. Each company will certainly benefit if the quality management system is certified by a third party certification authority. The best is if this authority is an organization also accepted abroad. A very important factor is also the attitude of the company’s leadership towards how the quality management system is used to benefit the organization and whether the principles of the system are regularly used in the practice.

Key words: ISO, management, quality, quality management, quality management system, TQM

JEL Classification: M000, M110, M190

1. Introduction
At present, each producer who wants to be successful in the competition on demanding markets of developed industrial countries or on less demanding local markets must ensure its products having not only the appropriate level of quality, but the quality must be also continually assured and demonstrated in the long run. Therefore, the term quality as well as compliance with customer requirements should be in the focus of each company as it has the crucial effect on the satisfaction of customers, their loyalty, and the prosperity of the company is the final result. We have to understand that quality management nowadays is a necessity but at the same time it must be stressed that the introduction of such a system does not automatically represent an improvement of the company. It is a long-term process that should lead to improvement of satisfaction of customers and other stakeholders, efficiency, cost and risk reduction, increasing labour productivity, a clear identification of responsibilities, and last but not least the improvement of quality of the product itself. It is an advantage for companies to have a quality management system certified by a certification authority. Most ideally, this authority should be a company accepted internationally. A daily fight with problems of companies should be replaced by prevention and the long-term planning and improvement of processes within the
The permanent quality of products or services can be achieved only by a systematic prevention of shortcomings and focus on an exact production process and compliance with internal quality guidelines and working methods. For an organization to be successfully managed and operating, it has to be managed and led in a transparent way. The implementation of such a system is not simple; the company culture plays an important part in it. It is therefore necessary to create favourable conditions, motivate people adequately, and establish a creative atmosphere, support team work and communication.

The currently valid usage “achieve the highest possible quality” has been interpreted by some companies in their own way. They don’t focus on the achievement of the highest quality, but on the achievement of quality on the level required by customers. On the other hand, in the common segment, the customers, however, don’t want to accept any compromises in terms of quality, but they require lower prices. It is a big challenge for companies to cope with these current trends on the market. Marinič (2008) has added that a satisfied customer is a synonym of a loyal customer, and his satisfaction originates from the overall value of the product or service that is influenced, besides the product or service image, customers’ expectations and the perceived quality, also by the quality of products in question. Mateides (2006) has defined the quality management as coordinated activities aimed at guiding and managing the organization with regards to quality, and he has based this definition on the norm STN EN ISO 9000:2005, on the part related to the quality management systems and the section Fundamentals and Vocabulary. He understands the quality management system as the structure of the organization, the methods, processes and resources necessary for the implementation of the quality management. Three concepts of quality management have been established in the evolutionary development: the conception of company or branch norms, the ISO conception and the TQM conception. An important instrument for the quality improvement and the central instrument for the quality management assessment is the internal audit. Beránek – Kotek (2003) have stated general and main steps during the certification of the entire organization or the certification only of its part. The certification can be preceded by a preliminary voluntary audit in that the auditors of the certification authority assess the quality management system.

2. Data and methodology

The goal of the presented research is to evaluate the implementation, development, assessment and contributions of the quality management system in Slovak food processing companies and to submit an overview of quality management systems applied in Slovak companies.

In this research, primary data have been used taken from the own research, and the secondary data have been taken from the documents of the State Veterinary and Food Administration (Štátna veterinárna a potravinová správa), the reports of corresponding Ministries, the ISO documents, the Annual Reports of the Office for Normalization, Metrology and Examination of the Slovak Republic (ÚNMS SR), the Annual Reports on the situation of agriculture and food industry in the Slovak Republic, and the internal material of companies. The goal has been achieved through a questionnaire survey with the aim to get familiar with the level and the situation of application and implementation, development and assessment methods in relation to the quality management systems in selected companies in the Slovak Republic. The basic research method was the questionnaire. The criterion for the establishment of the research sample was companies operating in the Slovak Republic. The questionnaire had 2 parts: The Part A consisted of 7 questions and contains the information about the questionnaire respondents. The 7 questions focus on the definition and identification of the legal status of the company, the industry branch in which the companies operate, the company type, the company size according to the categories by the European Commission as of January 1, 2005, the duration of their economic activity, the number of employees, the character of management.
international), owners etc. The Part B consisted of 14 questions, 11 of them were with closed answers and 3 questions were with open-ended alternative answers. The data gathered by the questionnaires and the research have been structured in overviews (in form of tables and charts) for further processing, the consequent analysis, assessment and evaluation. During the analysis of relations and interdependencies between the qualitative factors, the association and contingency analysis has been used. The existence of interdependence between the factors has been verified by a Chi-squared test. We have also used the following methods: Index Analysis, SWOT, Pareto analysis, Brainstorming and Benchmarking.

3. Results and discussion

*The current situation of quality management in the world*

The number of ISO 9001 worldwide certifications achieved 1,138,155 in 2014. The following table proves this; we have added a chart for a better clarity. It follows from the table that the ISO 14001 is popular, too, whereas the ISO 22 000 and ISO 16 949 certifications have been required less and in incomparably lower numbers than ISO 9001 and ISO 14 001. It is connected with the fact that the ISO 22 000 as quality and food safety management is a specific norm, the same applies to the norm that is used exclusively in the automotive industry and in the automotive supplier industry. The relatively new ISO 22 000 norm has registered the fastest growth, beginning from a different (lower) starting basis.

**Table 1: Overview of overall numbers and the worldwide growth of issued certifications according to ISO 9001, ISO 14 001, ISO 22 000 and ISO 16 949 in the period 2005-2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 9001</td>
<td>773,943</td>
<td>896,905</td>
<td>951,486</td>
<td>980,322</td>
<td>1,063,751</td>
<td>1,118,510</td>
<td>1,079,220</td>
<td>1,096,987</td>
<td>1,126,460</td>
<td>1,138,155</td>
</tr>
<tr>
<td>ISO 14001</td>
<td>111,163</td>
<td>120,211</td>
<td>154,572</td>
<td>188,574</td>
<td>222,974</td>
<td>251,548</td>
<td>261,926</td>
<td>284,654</td>
<td>301,622</td>
<td>324,148</td>
</tr>
<tr>
<td>ISO 22000</td>
<td>na</td>
<td>na</td>
<td>4,122</td>
<td>8,185</td>
<td>13,838</td>
<td>18,580</td>
<td>19,351</td>
<td>21,278</td>
<td>26,947</td>
<td>30,500</td>
</tr>
<tr>
<td>ISO 16949</td>
<td>17,047</td>
<td>27,999</td>
<td>35,198</td>
<td>39,320</td>
<td>41,240</td>
<td>43,946</td>
<td>47,512</td>
<td>50,071</td>
<td>53,723</td>
<td>57,950</td>
</tr>
</tbody>
</table>

*Source: http://www.iso.org/iso/iso-survey and the own compilation*

**Figure/Chart 1: Overview of the worldwide growth of ISO certifications**

Source: http://www.iso.org/iso/iso-survey

**Figure/Chart 2: Overview of the ISO 9001 certification share worldwide in 2014**

Source: http://dx.doi.org/10.15414/isd2016.s13.09
When comparing the number of ISO 9001 issued certifications and their worldwide distribution by 2014, we can see that the highest demand was in Europe (42.5%), followed closely by East Asia and Pacific (41.8%). Other world regions have rather an insignificant position in terms of demand for ISO 9001 certifications representing max. 10% of the worldwide demand. In terms of the regional distribution of ISO 14 001 issued certifications and the demand for them before 2014, the highest share of interested customers are companies from East Asia and Pacific (51.3%), followed by European companies (38.2%). ISO 22 000 is in a similar position with a share of 46.7%, whereas 34.9% is in favour of East Asia and Pacific and Europe. Almost 8% are companies from Central and South Asia, the rest is a negligible amount. ISO 16 949, the norm used in the automotive industry and its suppliers was so far the most demanded norm in East Asia and Pacific (with a share of 56.5%), Europe (20.4%), North America (10.2%) and in Central and South Asia (8%). This relates to the seat of main world automotive companies and their suppliers. All these facts are clearly demonstrated by the following figures. The most ISO 9001 certifications by 2014 were issued in Italy (229,928) and in France (113,349). In terms of the industries, the most certifications (118,652) were issued in the area of metal and metallic products processing, followed closely by the area of electric and optic components production (86,728 certifications). As far as the ISO 14 001 norm is concerned, the most certifications by 2014 were issued in Italy (178,137), in France (39,336). The most ISO 14 001 certifications were issued for building and construction companies as well as for companies in the area of metal and metallic products processing.

The current situation in the quality management in Slovakia

The following figure shows the development of ISO 9001 certifications in Slovakia in the period 1993-2014. It proves the growing trend and the growing interest in individual quality managements systems.

Differences between ISO and TQM
The ISO is a management system created for monitoring of functions and data in a specific organization and operating on monitoring basis. The TQM is a management system, too. It works on the basis of regular participation of employees, and it provides the correct management of instruments and technologies in individual departments. The ISO is a system ensuring the international standards requirements in terms of quality. The TQM are activities to achieve the corporate quality and culture with the aim to top the competitors by satisfying customer needs effectively and efficiently. The ISO standards deal with an effective documentation of methods how a company is managed in order to improve the profit margin. The TQM deals with customer satisfaction and employee efficiency in order to improve business and reduce costs. A company should first implement the ISO standards, and then implement TQM to improve the profitability and the loyalty of customers. The biggest difference between the TQM and ISO is the one is a method and a designation of an international organization. That means that a third party inspection analyzed the company policy and processes and found out that they comply with the ISO standards that are applied in the company. But what is their difference in terms of the output? The ISO describes functions and actions that must be implemented, so that the company has the minimum quality standards. The ISO can be regarded as an instrument for TQM implementation and has also some basic requirements, such as a strict documentation for audits. With the help of such management programmes, it is easy to monitor documentations in terms of quality. The TQM focuses on the identification of the best and maximum results and methods and how to achieve them. It can be perceived as a management system based on quality. The TQM does not require any kind of documentation. The research about the TQM implementation has shown a high level of employee and product improvement. The ISO systems were not able to achieve the same quality standards without a support by TQM. Both systems should complement each other. In the long-term perspective, there is no difference between the two in terms of the output if both programmes work to improve the company functions. The usage therefore shows that both programmes can work better if they are implemented separately or for different purposes and goals in order to achieve the best results. It can be added that the ISO is rather a programme helping with the management processes. The TQM is not only a programme, although it helps to get to the core of the quality improvement process. The ISO requires a more sophisticated analysis. The TQM helps with the needs of the management in a more practical way.

As individual managements systems are not rigid but are being constantly developed to fulfil the requirements of the present world and the market environment, revisions of individual norms are implemented in regular intervals. So, e.g. we know a number of editions of the ISO 9001, specifically from 1987, 1994, 2000, 2008. The most up-to-date version is from 2015. In the recent years, the ISO 9001 for the certification of quality management systems and ISO 14001 for the environmental management systems certification were subject to analysis, whereby the International Accreditation Forum (IAF) and ISO published new norms in the versions ISO 9001:2015 and 14001:2015 on 15 September 2015 i.e. edition from 2015, that replace the ISO 9001:2008 and ISO 14001:2004. In accordance with the resolution adopted on the 27th IAF General Assembly, a transitional period of three years was established for the implementation of ISO 9001:2015. At the same time, the 28th IAF General Assembly determined a transitional period of three years for the implementation of ISO 14001:2015. The IAF General Assembly, at the same time, determined the policies for the operation of certification bodies and certificated organizations of customers during the transition to new standards (IAF Document IAF ID 9:2015 for ISO 9001 and IAF Document ID 10:2015 for ISO 14001). The General Assembly determined with these resolutions the three-year transitional period for the implementation of new standard versions that ends on 15 September 2018. Our most known certification authority TÜV SÜD Slovakia s.r.o. issued a declaration in this connection that “it will certify the quality and environmental management systems in the
transitional period according to both standard versions, i.e. ISO 9001:2015 as well as ISO 9001:2008; and ISO 14001:2015 as well as ISO 14001:2004. The certifications issued according to the original standards ISO 9001:2008 and ISO 14001:2004 will be valid only until 14 September 2018.”

Changes in terms of the recent revisions of standards in 2015

The ISO 9001 and 14001, their revisions from 2015, were issued on 15 September 2015 and their impacts, changes and consequences are subject to intensive analyses among experts. The last large revision, for example of ISO 9001, was carried out in 2008, i.e. after 7 years, and the issue of new standards is an important milestone in the quality management systems. The results of analyses are subject to internal know-how of certification companies, and, as it has been already mentioned above, these systems are complex systems, and there is a 3-year transitional period for the implementation of new standards. But on the Internet, first results of analyses can be found, and it is possible to sum up the differences between the new and the old revisions of standards. It is known nowadays that the new 10-chapter structure is the fundamental change. The aim of this change is to unify formally the structure of the content of all quality management standards that have been issued and are being issued, such as ISO 9001, ISO 14001, OHSAS 18001 (in the new version of ISO 45001), ISO 27001 etc. and to ensure their easier and simpler implementation.

ISO 9001:2015

The standard uses in the entire wording the following verbs for the requirements:

- “shall” as requirements,
- “should” as recommendations,
- “may” as permissions,
- “can” as possibilities or capacities.

Besides this change, the ISO 9001:2015 will bring, in comparison to the revision from 2008:

- a higher flexibility of requirements, a more general and simple character of the application of requirements for companies and organizations providing services,
- a more explicit emphasis on the process approach and PDCA methodology,
- risk and opportunities managements in all processes included in the quality management system,
- a better orientation for a performance increase of companies and organizations,
- new definition of leadership for the top management and its better involvement into the quality management system,
- requirements for active search of opportunities for the improvement of the quality management system.

In the structure of the new standard, the new revision of ISO 9001:2015 will bring, in comparison to the revision from 2008, the following:

Chapter 0. Introduction

- emphasis on the strategic decision to adopt the quality management system,
- emphasis on the process approach and its application within the requirements of the norm – the norm includes a graphic presentation of the process and its elements,
- a new chapter focusing on the application of the PDCA methodology in processes – the norm includes a graphic structure of chapters (processes) of the norm according to the PDCA principle,
- a new chapter describing the principles of thinking based on risks that is applied in the entire norm,
• Quality management principles are stated already in the introduction of the norm.

Chapter 1. Scope
• The purpose of the norm remains, but the Article 1.2 Application and the term “exception” related to it were deleted.
• The term “product and service” is interpreted in the norm only as a “product and service” defined or required by the customer.

Chapter 2. Normative references
• The norm states the reference to ISO 9000:2015 Quality Management Systems – Fundamentals and Vocabulary (this norm is also revised and was issued together with ISO 9001:2015 in September 2015).

Chapter 3. Terms and definitions
• The norm states a reference to ISO 9000:2015 Quality management systems – Fundamentals and Vocabulary.
• The term “product” was replaced by the term “product and services”.
• New terms and definitions were added:
  • risk,
  • top management,
  • documented information,
  • outsource,
  • context of the organization,
  • function, strategy
  • knowledge, innovation., data, information etc..
• Some definitions for original terms were specified and updated.

Chapter 4. Context of the organization
• New requirements for identification and monitoring of internal and external impacts that are important for purposes and the strategic direction of the company.
• New requirements for the determination of stakeholders and their requirements that are important for the quality management system.
• The scope and limits of the quality management systems will have to be determined as documented information.
• It is not explicitly required to prepare a quality guide.
• New requirements for processes were added, such as determination of inputs and outputs, competencies, performance indicators, risks and opportunities.

Chapter 5. Leadership
• A higher extent of competencies and involvement of the top management will be required.
• The task of the top management is extended and includes leadership as well, not only management.
• A new requirement for the integration of requirements of the quality management system into “business processes”.
• The requirement for the nomination of the management representative was not stated.
• A new requirement for the determination of risks in relation to the customer.

Chapter 6. Planning
• A new basic requirement for the determination of risks, opportunities and measures how to solve them.
• Risk and opportunities management and the measures how to solve them are replaced by the preventive activities.
• A new requirement for planning to achieve quality objectives.
• Changes of the quality management systems will have to be planned.

Chapter 7. Support
• This chapter includes the management of people, infrastructure, and environment for the process operation monitoring and measuring resources, organizational knowledge, competencies, awareness, communication and documented information.
• The management of documents and records is, in the new way, defined as “documented information” – there is no requirement to process 6 documentation procedures.
• New requirements on the management of organizational knowledge.
• Monitoring and measuring resources replace the monitoring and measuring devices.

Chapter 8. Operation
• Operation planning and management focuses on the planning, implementation and management of processes and measures against risks.
• The communication with the customer is preferred to the definition and analysis of his requirements.
• A new requirement for the determination, implementation and maintenance of design and development processes.
• Purchasing has been changed to “management of externally provided processes, products and services”.
• A new requirement for determination of performance indicators of external providers.
• A new chapter and requirements for the release of products and services.
• In the entire chapter, the emphasis is on the application of process management, risk management and measures.

Chapter 9. Performance evaluation
• A new requirement for the performance and efficiency evaluation of the quality management system.
• A new requirement for the efficiency evaluation of measures against risks.
• A new requirement for performance evaluation of external providers.
• Each internal audit will have to have defined independent criteria and scope.
• This chapter includes also the “analysis by the management” – inputs in the analysis were added.
• Evaluated indicators will have to be added with their development trends.

Chapter 10. Improvement
• The article “Preventive measure” was eliminated – replaced by the risk and opportunities management.
• A new requirement for active determination of opportunities for improvement.
• New requirements connected to the analysis of reasons for discrepancies.
4. Conclusion

The resources of every company are limited, that’s why it is necessary to start the necessary improvement from the biggest shortcomings, and areas where we can achieve the biggest, the most relevant and most visible improvements. The research result was the finding that the ISO 9001:2008 is one of the most frequently applied international quality management norm, whereby the number of ISO 9001 worldwide certifications in 2014 reached the number of 1,138,155 in 178 countries all over the world. As we could find out in the research, the largest demand for ISO 9001 certifications is in Europe (42.5%), followed closely by East Asia and Pacific (41.8%). In relation to ISO 9001, the largest demand for certifications was in Europe, the next very popular norm, ISO 14 001, had the largest share of interested parties from East Asia and Pacific (51.3%), followed by European companies (38.2%). The situation is similar in connection with ISO 22 000, its share is 46.7% in favour of East Asia and 34.9% in favour of Pacific and Europe. Almost 8% are companies from Central and Southern Asia, the rest is a negligible share. The norm used in the automotive industry and its suppliers, ISO 16 949, has been so far demanded mostly in East Asia and Pacific. The highest number of ISO 9001 certifications by 2014 was issued in Italy (229,928) and in France (113,349). In terms of industries, most certifications, i.e. 118,652, were issued for metal and metallic products processing, followed closely by the electric and optic components production (86,728 certifications). The same demand for certifications was noticed in relation to the ISO 14 001, the highest number of certifications by 2014 was issued in Italy (178,137) and in France (39,336). Most ISO 14 001 certifications were issued for companies in the building and construction industry (43,999) as well as for companies in the area of metal and metallic products processing.

Our research has shown that the interest for certifications has been growing every year, and the companies have been aware of the need and benefits of certification for them. That is why the revisions of ISO 9001 and 14001 from 2015 have been recently the most observed revision. These revisions were issued on 15 September 2015 and their impacts, individual changes and consequences are subject to intensive analyses among experts as this revision has come (in case of ISO 9001) after 7 years and in case of ISO 14001 after 10 years.

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