

Risk assessment in the enterprise management system

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Abstract

The essence of the article is to present the results of research on the importance and benefits of risk assessment in the quality and occupational health and safety management systems of enterprises in Slovakia. Part of the goal is the evaluation of the most important risks in the quality and occupational health and safety management systems of enterprises in Slovakia. Basic scientific methods, as well as mathematical-statistical methods, were used to evaluate the data obtained from the survey to fulfill the set goal. The results show that enterprises are currently more concerned about the risks arising from the OSH management system than from the risks of the quality management system. The most serious risks considered by enterprises in the occupational health and safety management system are an increased number of accidents and in the quality management system customer dissatisfaction.

Keywords: risk assessment, management system, quality, OSH, enterprise

1 Introduction

Current threats from an unpredictable business environment, challenging competitive environment, new customer requirements, and constant legislative changes force the management of enterprises to constantly address the performance and efficiency of their organization (Andreeva et al., 2019). Effective tools for streamlining business management are implemented management systems, successful process management, greater scope for prevention, and the application of business risk management (Holla, 2017). For this reason, many enterprises mainly implement quality and occupational health and safety management systems, the implementation of which, according to international standards, mandates the management of risks in the given area.

From the quality point of view, enterprises are increasingly forced to monitor the demands and expectations of their customers and try to fulfill these expectations as much as possible (Bashan, Kordova, 2021). For this reason, enterprises constantly improve the quality of their products or services. The quality management system is a tool for achieving this goal and provides the enterprise with the opportunity to continuously improve the processes in the quality system, thereby achieving the satisfaction of customers and other stakeholders (Montoya et al., 2022). It also provides an increase in confidence in the enterprise, that it is able to offer such products that are in line with customer requirements.

The increasing globalization and fragmentation of supply chains continuously increase the level of OSH risk for multinational organizations as their business, suppliers, and customer functions cross more geographical

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boundaries (Sánchez-Herrera, et al., 2019). Without the assurance of reliable occupational health and safety within this supply chain, an enterprise may unwittingly be exposed to significant legal, financial, and reputational damages. An occupational health and safety management system helps to protect and promote the health and performance of workers, as well as promote occupational health and safety throughout the supply chain. Using the system, the enterprise increases safety, reduces workplace risks, and creates safer working conditions (Šoltés et al., 2022).

Gradually, all over the world, enterprises are becoming more interested not only in performance in the quality management system but also in the occupational health and safety management system. In order for enterprises to achieve the most effective performance and success in these systems, they implement a risk management system in their internal processes.

Most of the scientific papers about health and safety issues are oriented towards the assessment of risks, especially from the point of view of the fulfillment of legal obligations. There are few authors who deal with risk assessment in the field of quality management systems. Part of management systems is to know not only the risks resulting from legal requirements but also normative or customer requirements. The originality of the paper lies in the fact that so far no study has been prepared that would address the identification of risks in the quality management system, and OSH management system as a prevention of possible crises in the enterprises. The basis is the approach of responsible quality managers and health and safety managers to the effective implementation of management systems and the established culture of risks in the enterprise.

The main goal of the paper is to present the results of research on the importance and benefits of risk assessment in the quality and occupational health and safety management systems of enterprises in Slovakia. Part of the goal is the evaluation of the most important risks in the quality and occupational health and safety management systems of enterprises in Slovakia.

In the introduction, the authors explained the need and importance of the meaning of the problem, the originality, and the goal of the paper. In the review of the literature, they processed the issue of risks in the quality management system, OSH management system, and risk management. In the next part, the authors presented the main points of the research and the scientific ones used. In the next part, they processed the results of the empirical research and in the end, presented the main benefits of the paper.

2 Risks in the Quality and OSH Management System

The quality management system is a dynamic, long-term, and never-ending process, the essence of which is mainly a change in the approach of the managers and the subsequent involvement in the process of all employees at different levels of management for better customer satisfaction, gaining competitive advantages and, last but not least, improving quality of products or services (Gremyr et al., 2021).

The ISO 9001:2015 Quality management system - Requirements standard, which is one of the world's most popular standards, is used by enterprises for the application of the quality management system (QMS). ISO 9001 serves as a basis for other important industry standards as well as for standards used in the quality management system, e.g. ISO 45001. The ISO 9001 standard was revised in 2015. One of the significant changes of this revision was the inclusion of a systematic risk management approach in enterprise management. In contrast to the previous approach, risk management was approached as a separate area of quality management systems. Risk-based thinking, as the revision of the ISO 9001:2015 standard states, integrates risks into the entire management system of the enterprise, i.e. integrates risk management (threats and opportunities) into all processes included in the quality management system. In the revision of ISO 9001:2015, risks are considered from the beginning across the entire standard, and preventive measures are part of strategic planning, operational processes, and reviews.

Quality risk, according to the ISO 9001 standard, is defined as a combination of the likelihood of occurrence and the severity of damage. Where damage is understood as damage to health, including damage that may occur as a result of loss of product quality or availability (STN ISO 9001:2016). Risks in the quality management system should be taken into account from the manufacturer or service provider and consumer point of view (Alzamil, 2019). From the manufacturer or provider's point of view, these risks can be defined as loss of reputation due to the supply of non-conforming products, loss of individual customers and entire markets, legal liability for low quality, deterioration of resources, waste of human labor, reduction of employee confidence in the enterprise's capabilities (Grimashevich et al., 2019). In the ISO 9001 standard requirements are placed on risks, in which it is necessary to manage risks and opportunities in the area of quality, integrate and implement measures to address these risks, and evaluate the effectiveness of the measures.

The OSH management system represents a part of the overall management system of the enterprise. It has created OSH concepts, manages OSH risks, and, in accordance with OSH management requirements and through their implementation, achieves effective business results and goals (Pačaiová et al. 2016). Enterprises use ISO 45001:2018 Occupational Health and Safety Management Systems - Requirements with guidance for use for the

application of the OSH management system. The standard was developed in response to an urgent request by enterprises, according to which their occupational health and safety management systems could be assessed and certified. The basic principle is the identification of all possible risks in the workplace and their effective management in such a way as to minimize possible damage to the health of employees and the related consequences. ISO 45001 provides a framework for an organization to manage risks and opportunities to help prevent occupational accidents and deterioration of health in order to improve and provide a safe and healthy workplace and protect workers at all levels of management. On the territory of the Slovak Republic, there are relatively many legal regulations in the field of occupational health and safety that are above the framework of European directives and conventions. This is also why the STN ISO 45001 standard is implemented in enterprises in Slovakia to a lesser extent compared to ISO 9001.

The risk from the occupational health and safety point of view, according to ISO 45001, is defined as "the combination of the likelihood of the occurrence of a dangerous event or action related to work and the severity of the injury and damage to health that may be caused by the event or action" Accident and damage to health defines risk as "an adverse effect on the physical, mental or cognitive state of a person." (STN EN ISO 45001:2019).

In the ISO 45001 standard requirements are placed on risks, in which it is necessary to identify hazards and assess risks and opportunities, determine measures to eliminate hazards and reduce risks in the field of occupational health and safety, and determine procedures for evaluating the effectiveness of the measures.

The risk assessment process in ISO 9001 and ISO 45001 is not defined. The technical commissions that developed the standards recommend that enterprises use ISO 31000 (Risk management. Principles and guidelines) and ISO/TR 31004 (Risk management. Guidelines for the implementation of ISO 31000) as supporting documentation for the application of risk management. The international standard provides a procedure for the correct management of risks in an enterprise, it defines risk management as "coordinated activities of direction and management of the enterprise with regard to risk" (STN ISO 31000:2019). The standard recommends that enterprises develop, implement, and continuously improve a framework that aims to integrate risk management into enterprise-wide management processes (Ramos et al., 2015). In this case, it is the penetration of standards, which are oriented toward the integration of risk management into all key processes in the enterprise (Buganova et al., 2021).

The risk management system should be based on the fact that risks (including their interconnections and interactions) are continuously and systematically identified in the enterprise (Samani, 2019). According to Masár et al. (2022) within the framework of the risk management system, the following activities should be carried out: the formulation of policy, strategy, and objectives of risk management, the design of the framework, principles and process of risk management, the definition of procedures, methods and tools, clearly establish the responsibilities and authorities within the framework of risk management, risk management processes must be continuously monitored, evaluated, documented and improved.

3 Research methodology

The authors of the paper carried out empirical research focused on the issue of risk assessment in quality and occupational health and safety management systems of enterprises in Slovakia in 2022. As part of the research, a survey was carried out, from which answers were obtained from 306 responses of owners and managers from small, medium, and large enterprises, as the main statistical units. The main statistical units were quality managers, and OSH managers, and owners of small, medium, and large enterprises. Within the structure of the respondents, the enterprises were divided from the size point of view based on the number of employees (small enterprise with up to 49 employees - 56%, medium-sized enterprise with more than 50 and up to 249 employees - 32%, large enterprise with more than 250 employees - 12%). Industry composition: Energy industry 3%, Engineering industry 4%, Chemical and rubber industry 4%, Electronics and electrotechnical industry 3%, Metalworking industry 44%, Woodworking industry 16%, Food industry 8%, Textile industry 18%, other 10%.

To fulfill the stated goal of the paper, scientific methods such as basic analysis, inquiry, and statistical methods were used to evaluate the data. Baseline analysis was used in the process of identifying and solving various problems of the investigated issue, e.g. analysis of knowledge from professional literature and scientific works to elaborate the current state of the problem, analysis of the results of a survey assessing risks in enterprises in Slovakia. The inquiry method was applied using an online questionnaire tool. The online questionnaire was created using the Google Form platform, which provides a suitable environment for data collection, as well as their sorting and export to MS Excel. Google Forms provides a convenient environment for creating questionnaires, data collection, presentation of results, and simple evaluation. The composition of the questions was based on the authors' own experience with the mentioned issue within the framework of projects at the University of Žilina (project VEGA 1/0243/20 - Integrated risk management system in the conditions of contemporary changes in enterprise environment in Slovakia and project APVV-20-0603 - Development of Risk Assessment Tools for

Selected Businesses and Professions in the Slovak Republic in accordance with the EU Requirements), analysis of the current state of the issue in the world, and work experience.

The questionnaire consisted of 15 questions and was divided into two parts. In the first part, there were characteristics of the enterprises, such as the size of the enterprise and the industry of the enterprise. In the second part, are professional questions directed to risk management in the enterprise's management systems, prerequisites, and barriers to implementing risk management. The questionnaire was created in order to find out the subjective perception of quality managers and OSH managers regarding their attitude to risk management in the enterprise.

4 Survey results

Among the main results from the conducted empirical survey was the finding that management system owners and managers pay more attention to the assessment of risks and emphasize their reduction. They were asked to set a priority from 1 to 3 (where 1 – was the highest priority, and 3 – was the lowest priority) for the following management systems: quality, occupational health and safety, and environmental.

The results of the presented survey show that the owners and managers of enterprises in Slovakia determined the following, Fig. 1:

- two-thirds of enterprises (66%) gave the highest priority to the occupational health and safety management system. This system dominated all sizes of businesses,
- quality management system was assigned the highest priority by only a quarter of enterprises (24%), most often it was set as the third priority,
- they set the lowest priority for the environmental management system (47%).

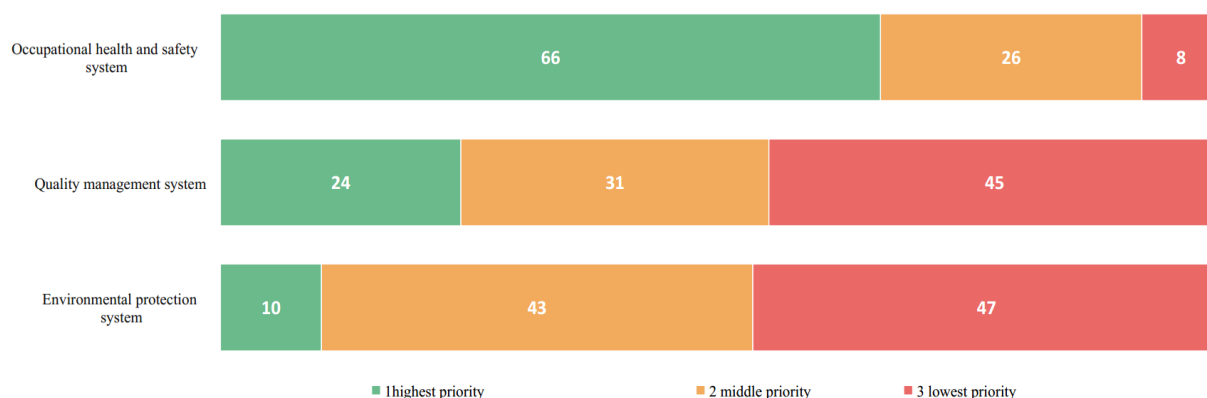


Fig. 1. Percentage expression of perceived risks in quality, occupational health and safety, and environment management systems by owners and managers of enterprises in Slovakia (Source: Authors)

As part of the survey, it was also assessed, which risks in the quality management system the owners and managers of enterprises in Slovakia pay more attention to. They were asked to set a priority from 1 to 5 (where 1 – was the highest priority, 5 – was the lowest priority) to the following risks in the quality management system: customer dissatisfaction, declining economic results of the enterprise, increase in the cost of poor quality, defective – non-conforming products, reduction of productivity.

The results of the presented survey show that the owners and managers of enterprises set the risks in the quality management system as follows, Fig. 2:

- the highest priority in almost half of the business owners and managers addressed, was customer dissatisfaction (46%),
- medium priority is given to increasing the costs of poor quality (25%),
- enterprises set the lowest priority for defective – non-conforming products, less than a third of owners and managers (31%) indicated this.

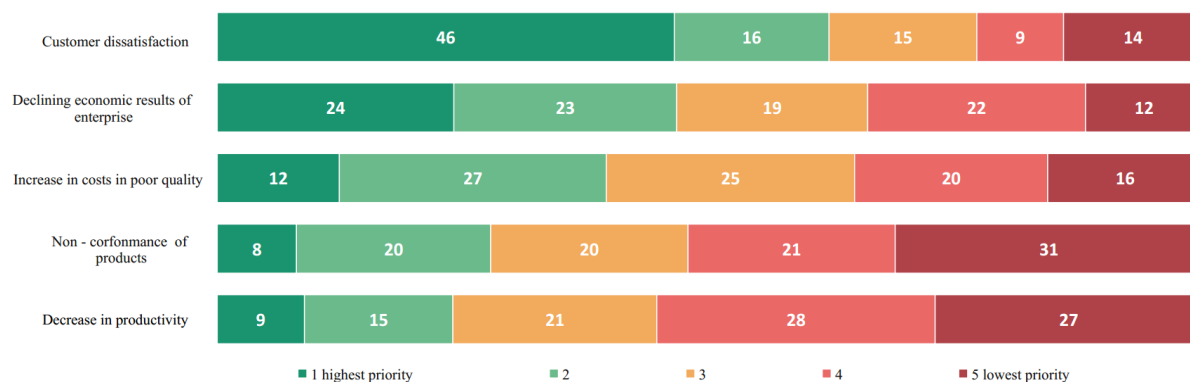


Fig. 2. Percentage expression of perceived risks in the quality management system by owners and managers of enterprises in Slovakia (Source: Authors)

Among other processed findings from the conducted survey, it was assessed, which risks in the occupational health and safety management system the owners and managers of enterprises in Slovakia pay more attention to. They were asked to set a priority from 1 to 5 (where 1 – was the highest priority, 5 – was the lowest priority) to the following risks in the occupational health and safety management system: increase in costs associated with sanctions and fines, increase in the number of accidents, increase in employer costs due to incapacity for work, increase in reimbursement costs damages to employees in the event of an occupational accident, deterioration of the ergonomic conditions of employees at the workplace.

The results of the presented survey show that the owners and managers of enterprises set the risks in the occupational health and safety management system as follows, Fig. 3:

- the highest priority was given to increasing the number of accidents (40%),
- medium priority is given to increasing the costs associated with sanctions and fines (24%),
- enterprises set the lowest priority for the deterioration of the ergonomic conditions of employees at the workplace (25%).

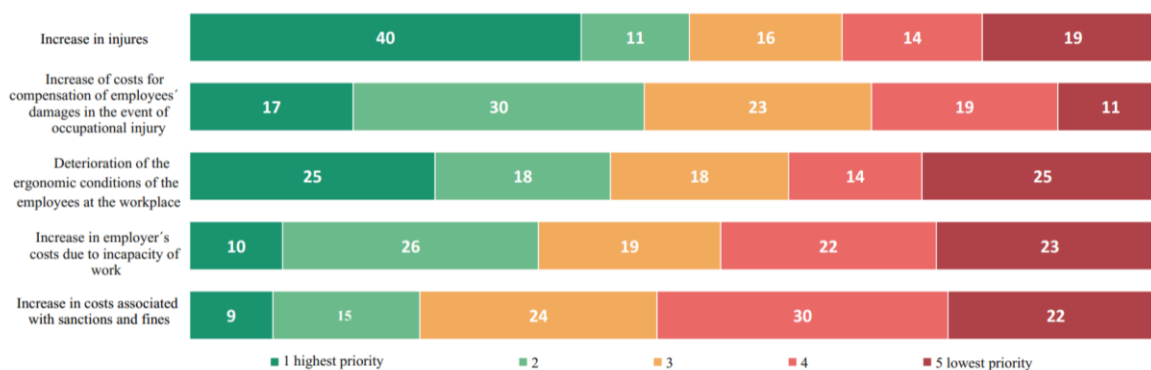


Fig. 3. Percentage expression of perceived risks in the occupational health and safety management system by owners and managers of enterprises in Slovakia (Source: Authors)

Other processed findings from the conducted survey included an assessment of the main benefits of joint assessment of risks in quality management and occupational health and safety management systems. Among the most significant contributions were:

- increase in workplace safety by 50%,
- increasing customer satisfaction by 44%,
- integrated view of key risks in the enterprise 41%,
- reduction of costs for the implementation of measures and time in connection with audits by 37%,
- increase in the probability of achieving set goals by 33%
- reduction of duplication of work and streamlining of processes in the enterprise by 29%.

The processed results show, that the owners and managers of enterprises in Slovakia are currently most concerned about risks in the occupational health and safety management system. The reason for this may also be the fact that the management of enterprises is more aware that a safe working atmosphere and the minimization of

the risk of accidents are key factors not only for the protection of employees but also for reducing the costs of occupational accidents and ensuring a continuous business operating cycle. This increased awareness of OSH may be due to experiences with adverse events at the workplace and the need to comply with established safety laws and regulations aimed at occupational health and safety. Reducing the consequences of occupational accidents is possible by implementing the integrated management systems in connection with the risk management system and the use of synergy to increase the effectiveness of the overall management of the enterprise. For this reason, many enterprises try to implement management systems, specifically best practices, into their internal structures, where they should also assess risks from the quality and safety point of view, fig. 4. If risk management is also included in the quality and occupational health and safety management system, the probability of achieving the enterprise's goals will increase, the consistency of individual outputs will be achieved, customers will be more confident that they will receive the expected product, the number of occupational accidents will decrease and employees will feel that they are working in a safe and healthy workplace.

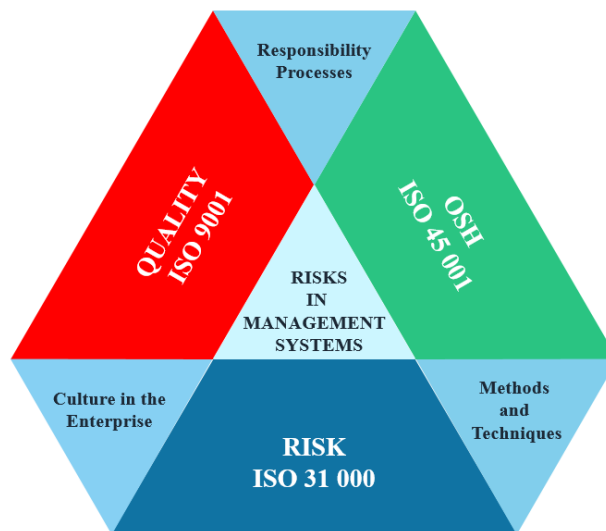


Fig 4. Connection of the quality and occupational health and safety management system and risks (Source: Authors)

Correctly applied quality and occupational health and safety management systems in connection with risks help to achieve the specified quality of products, and safety in the workplace and meet the requirements of customers in any industry. The implementation of these systems provides enterprises with a comprehensive and holistic view of critical factors affecting the quality of products and services, as well as the safety of workers and consumers, contributing to the efficiency of internal processes and the reduction of duplication in documentation and audits. The same principles, such as a systematic approach, leadership accountability, employee involvement, and continuous improvement, are applied to both systems, enabling better coordination and collaboration between different departments and levels of the enterprise.

Most enterprises in Slovakia are aware of the value of ISO 9001 and ISO 45001 certification, but it is important to realize that the purpose of these standards is mainly to increase the efficiency and effectiveness of the entire management of the enterprise. The connection between the quality and occupational health and safety management system and risks guarantees the constant improvement of the enterprise's relationship with customers, employees, and other interested parties.

5 Conclusion

The integration of quality and occupational health and safety management systems together with risk management is becoming more and more popular, enterprises are realizing its benefits. Effective risk management in conjunction with quality and occupational health and safety management systems can contribute to building customer trust and improving the enterprise's reputation. In addition, these approaches can also increase the efficiency of production and business processes, which will improve results and achieve sustainable business development.

According to the findings, it is clear that current enterprises are more interested in solving risks associated with the occupational health and safety management system than in the risks related to the quality management system. The results of the research showed that the biggest threats in the field of occupational health and safety are related

to the increase in the number of accidents, which clearly indicates the need to strengthen preventive measures and safety procedures. On the other hand, when it comes to quality, concerns are focused on customer dissatisfaction, which signals the need to better monitor customer feedback and adapt products or services to their needs. Given the constantly changing market conditions and requirements, it is essential that quality and occupational health and safety managers keep in mind the value and importance of proper risk assessment and their solutions.

The processed results can serve as a valuable guide for enterprises to effectively invest resources and focus on the aspects that have the greatest impact on their success and sustainability. The results of the paper point to the importance and meaning of risk assessment in quality and occupational health and safety management systems. They emphasize the need for prevention and bring new demands on quality and occupational health and safety managers to successfully apply risk management in their processes. The results expand existing knowledge in the field of management system risks and are valuable material for business practice, not only for quality managers and OSH managers but also for top managers in enterprises. In addition, these approaches can also increase the efficiency of production and business processes, which will improve results and achieve sustainable business development. The results of the paper can significantly advance knowledge in this area and can be beneficial for all types of enterprises not only in Slovakia but also in other European countries.

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