

## MANAGEMENT SYSTEMS AS A GUARANTEE OF QUALITY ASSURANCE

Marcin OLKIEWICZ

Politechnika Koszalińska, Koszalin; marcin.olkiewicz@tu.koszalin.pl

**Abstract:** The aim of this study is to study compounds, that quality, as part of standardised management systems, affects safety, which is one of the primary elements for the functioning and development of an organisation. In the presented paper many attempts were made to indicate that quality is closely connected to safety, and as part of standardised management systems, significantly affects the improvement of the effectiveness of actions undertaken, consistent with the adopted strategy and the vision of an organisation. The conclusions from the conducted research state that standardised management systems are aimed at improving and maintaining quality as well as the fact that *maintained safety* allows to achieve it. The research results are part of a multi-aspect analysis of the Central Pomeranian entrepreneurship used to build models of quality shaping in organisations within the qualitative foresight framework. Obtained results, from more than 1,600 entities, confirm the hypothesis that safety is an important element of quality development under standardised management systems.

**Keywords:** quality, safety, process management, management systems.

## SYSTEMY ZARZĄDZANIA GWARANCJĄ BEZPIECZEŃSTWA JAKOŚCI

**Streszczenie:** Celem opracowania jest badanie związków, że jakość, w ramach znormalizowanych systemów zarządzania, oddziałuje na bezpieczeństwo, które stanowi jeden z głównych elementów funkcjonowania i rozwoju. W opracowaniu starano się wykazać, korelację jakości i bezpieczeństwa, która bezpośrednio wpływa na poprawę efektywności podejmowanych działań, zgodnych z przyjętą strategią oraz wizją organizacji. W ramach przeprowadzonych badań stwierdza się, że znormalizowane systemy zarządzania mają na celu doskonalenie i utrzymanie jakości, a zachowane bezpieczeństwo pozwala je osiągnąć. Szczególnie uwidacznia się zjawisko to w procesie planistycznym oraz realizacji. Uzyskane dane w ramach przeprowadzonej ankietyzacji z ponad 1600 podmiotów potwierdzają hipotezę, że bezpieczeństwo stanowi ważny kształtowania jakości, w ramach znormalizowanych systemów zarządzania.

**Słowa kluczowe:** jakość, bezpieczeństwo, procesowe zarządzanie, system zarządzania.

## 1. Introduction

Assuring the safety of the country as well as the development of the regional, society and entrepreneurship is one of the most important elements of shaping quality (including the quality of life). Each entity seeks security, and the growing and changing expectations and requirements placed by stakeholders, globalization, technological progress, etc. enforce the need for continuous pro-quality activities. Constant development guarantees the creation of new opportunities for self-improvement, increasing competitiveness, efficiency, production, entrepreneurship, etc. An element that allows for the sustainable development of quality in an organization, ensuring safety, i.e. personal data, information, production, etc., is an appropriate set of quality instruments, which includes management systems.

A quality management system (QMS) is a set of interrelated or interacting elements designed for setting policy and objectives in order to achieve set goals, used to manage an organization and its supervision in relation to quality (Olkiewicz, 2017). This means that organizations, through systemic actions, should in a continuous manner implement a specific quality strategy in order to achieve significant development in the long-term. This study is a review and an attempt to show the complexity of quality identification and safety, as well as their mutual interpenetration and interaction. The study, confirmed by research, emphasizes the importance of improving the quality of the standardized management systems. From such a perspective, safety is considered as a guarantee of achieving quality-oriented objectives and quality determines their degree of implementation (satisfaction).

## 2. Literature review

In the era of globalization and rapidly changing factors surrounding the society, organization and the country, the sense of safety began to gain special significance. Increasing uncertainty, unpredictability of socio-economic, political and military developments results in limiting the sense of safety and, consequently, increasing concerns, various types of threats and crisis situations. Undoubtedly, safety, apart from freedom, is the foundation for the proper functioning of entities (nations, organizations, society, etc.) that creates values of well-being (also referred to as the quality of life). Therefore, in the literature, safety, as an ambiguously interpreted concept, refers to various scientific disciplines (Grochowski, Letkiewicz, Misiuk, 2011).

Safety perceived in terms of status and process is created and shaped based on resources, knowledge, skills and experience owned by individual units. In practice (everyday life) a paradox arises in which the faster the entities (countries, society, organizations) grow

(increasing their expectations and their own value) the more dangers and various types of threats awaits them, which results in the need to increase security. This means that when considering safety, the following issues cannot be omitted: opportunities, chances, challenges, risks, threats, etc. that are inseparably connected with security and directly affect the effectiveness (Łuczyszyn, Łuczyszyn, 2017; Ładysz, 2014) of achieving tactical and operational assumptions and strategic goals (Koziej, et al., 2013), including qualitative ones (Zymonik, 2012; Deb, 2015; Ciobanu, Toader, Managerial, 2016).

From the point of view of an individual-nation, security is perceived as providing certain (constitutional duty) conditions (Drewe, 2008; Żukrowska, Gręcik, 2006): economic, military, political, social, cultural, technical, ecological, food, energy, etc. permitting for permanent functioning and the develop of the system of values, in line with government (Layton, 2015; Dworzecki, Bąk, 2016; Antoshin, Yershov, 2015) and stakeholder's expectations. From the point of view of an organization, however, – security is focused on achieving the goal (increasing the value of the entity), thus mainly includes the following aspects: economic, social, technical, information, raw materials as well as ecological and cultural (Cholez, Girard, 2014, Olkiewicz, 2015; Olkiewicz, Bober, Majchrzak-Lepczyk, 2015). The lowest number of conditions in the area of security are visible in societies, oriented to social and living conditions, and they include: economic, social, welfare, food and ecological. All presented safety aspects are closely related to quality, because quality is a safety parameter. It should therefore be assumed that higher quality means more safety and vice versa.

However, regardless of which point of view (concerning safety) is taken under consideration, two aspects are distinguished:

- objective – concerning the occurrence or possibility of occurrence of a real threat,
- subjective – concerning the perception of a sense of threat.

From an economic point of view, these states could be compared to a risk (realistically possible to be calculated) and uncertainty (the state of stakeholders' feelings). Such an interpretation of safety means that:

- the state subject to the estimation of the need to create new solutions, actions aimed at minimizing or reducing effects, risks, etc. is the active safety,
- the condition in which the previously adopted solutions will be used is passive safety.

This means that the use of all forms of limiting uncertainty and socio-economic, political, ecological risks (Baldzhy, 2017; Bielous, Sopko, 2016; Bilyk 2016; Solodovnic 2015) requires the so-called economic security to guarantee high quality within the framework of operation and development of entrepreneurship (Kim, Kim, French, 2015; Irimescu, Nastase, 2015) and improvement of production resources. Shaping safety must allow for a free movement of quality raw materials, capital, etc. necessary in the transformation process, the effect of which is to be an economic development achieved, among others, by: improving quality, increasing production efficiency, creating new products and services, professional activation,

entrepreneurial growth, etc. Therefore, safety in accordance with economy refers to (Kuciński, 2010):

- stability – maintaining and strengthening competitiveness through:
  - protection of property ownership,
  - shaping the relationship between the private and public sectors,
  - ensuring conditions within legal regulations framework,
  - minimization of occurrences that destabilize the functioning and development, of a criminal, pathological nature, etc.
- sustainability – care for maintaining a proper relationship between the level, the dynamics of functioning and development of entrepreneurship and the natural, social and cultural environment,
- innovation – creating the capacity for self-development, technological and organizational progress and implementation of innovations through:
  - modernization of the technology park and the human capital,
  - raising stakeholders' awareness,
  - cooperation between the research units (universities, research institutes, etc.) and the economy,
  - a more effective training and education system.

Why has quality become a synonym for safety and its evaluation parameter? The answer is difficult because quality, like safety, from a theoretical as well as practical point of view, is:

- a term of everyday use, the subject of considerations, the category of research, variously interpretative, perceived and defined,
- interdisciplinary,
- a creator of a process operation,
- a phenomenon significantly affecting the desire and the need to reach ever higher levels,
- a state requiring appropriate expenditures,
- constant development,
- basic determinant of achieving goals, etc.

Quality as: a feature (set of features), value, desired status, characteristics, state, feature (overall characteristics), as well as safety, should be considered as part of process activity – identification of needs (area of conscious market needs), planning of activity and activities (way of achieving technical parameters consistent with the assumptions), compliance checks and improvement of previous stages (verification and standardization of the achieved effect) that forms a comprehensive whole.

The process approach forces system intervention into activities related to:

- computerization – acquiring, processing, using and creating information necessary in the process of managing an organization, achieving goals and gaining potential partners, investors or external financial resources,

- coordination and supervision – synchronization of activities in time and space, with clearly defined funds, resources, objectives and effects,
- improvement – introducing activities related to the improvement of activities in all areas of the organization, increasing effectiveness, efficiency, profitability as well as satisfaction,
- interactivity – analysis and response to emerging interactions between the market and the enterprise and areas within the organization itself,
- creating a value chain – combining activities (processes), creating values (preferably added) in a chronological and efficient manner reaching the intended or expected parameter.

This means that quality, in the aspect of safety (Barafort, Mesquida, Mas, 2017; Tervonen, Pääkkilä, Haapasalo, 2011; Fallah, Murphy, Stohr, 2010), plays an increasingly important role in the areas of management, i.e.:

- strategic (among others: creating long-term development, creating the value of the organization and parameterization of the business objectives),
- operational (among others: efficiency and optimization of production, implementation and application of production management methods),
- organizational (among others: applying activities that internalize the organization, make the organizational structure more flexible (restructuring, reorganisation, reengineering, benchmarking, etc.)),
- resources of the organization (human resources, financial resources, information, etc.),
- security (among others: in aspects of environmental protection, IT security, personal data protection, design, business, etc.),
- quality (among others: production, performance and quality improvement, satisfying and increasing the satisfaction of stakeholders),
- projects (among others: implementing innovation, applying for external financing, creating cooperation between various research centres, etc.),
- others.

This means that the process approach focused on the areas of quality and safety in the organization determines a specific way of conduct (Abrahamsen et al., 2017; Tsung-Han, Man-Nun, Cheng-Yuan, 2017; Baldzhy, 2017), which is considered in the systemic approach (Hydyrov, 2017; Goreva, et al., 2016). Systemic quality management is built and implemented on strictly defined rules, procedures that are applied in organizations. They are comprehensive, flexible, universal and objective. It is worth noting that within management systems it is necessary to distinguish (Borys, Rogala, 2007; Lulewicz-Sas, Kobylińska, Ejdys, 2012) formalized systems, consisting of standardized and non-standardized quality management systems as well as non-formalized as, i.e., models of excellence.

Therefore, quality management in an organization, through quality management systems, is increasingly reflected in the developed (normalized) international quality standards by the International Organization for Standardization (ISO). In Poland, the most widespread quality management systems and related ISO norms include:

- PN-EN ISO 9001: 2015-10 (Quality Management System),
- PN-EN ISO 14001: 2015-9 (Environmental Management System),
- PN-N-18001: 2004 (Occupational Health and Safety Management Systems),
- PN-EN ISO 22000: 2006 (Food Safety Management Systems),
- PN-ISO/IEC 27001: 2007 (Information Security Management System).

### 3. Research methods

The analysis and assessment of quality development in the organisation, as part of standardised management systems, constituted the basis for determining the importance of safety. On the one hand, the safety aspect is considered as a system (ISO 18001 – Occupational Safety and Health Management Systems, ISO 22000 – Food Safety Management Systems, ISO 27001 – Information Security Management System), and on the other as a "guarantor" for the implementation of pro-quality activities.

For the purposes of this study, the author, by focusing on quality as part of standardised management systems, put the following research problems:

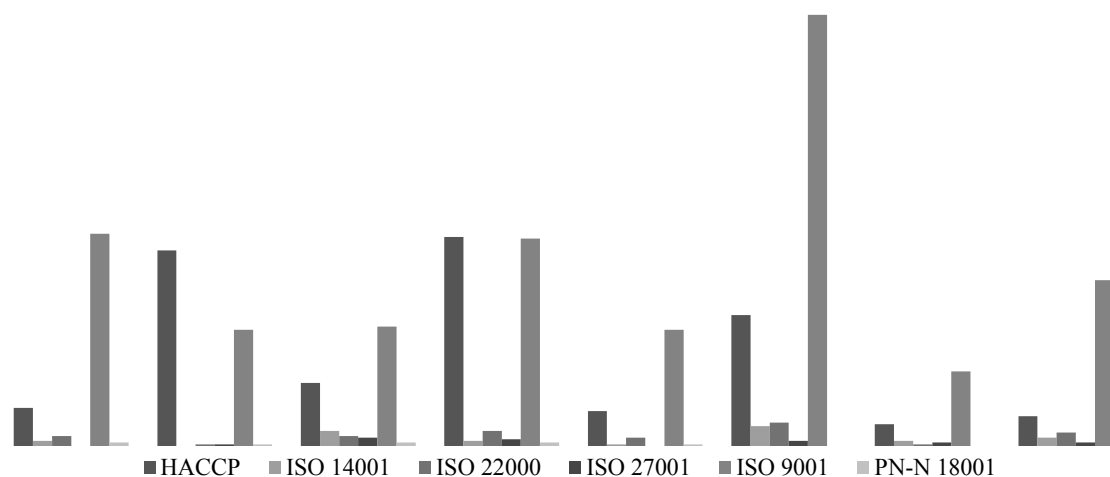
- Q1: Do organisations, which consciously use standardised management systems, want to increase the sense of safety of achieved quality (offered quality)?
- Q2: Do the strategic directions of quality improvement in the organisation guarantee safety of the quality?

The multi-faceted studies covered the years 2011-2014. The first survey was conducted in 2011 from January to April and the second from November 2013 to April 2014. In the first study (S1) the analysis covered 600 organisations. The size of the adopted population resulted from the number of responses received by the respondents, which reached the level of 86%. Through the analysis of the forms of distributed questionnaire (direct, via business-related organisations and the Internet) in the second study (S2) and increasing direct contact with potential organisations, this index reached the parameter of 92%. Research was carried out on business entities located in the Central Pomeranian region. The research results used for this study are a small element of the multi-aspect analysis used to build models of quality creation in organisations within the qualitative foresight framework.

#### 4. Research results

An appropriate strategy of action focused on quality and safety is aimed at ensuring peace (including: functioning, rationale, undertaking and carrying out activities, also economic ones) or creating safe conditions and trust guaranteeing the possibility of proper work and development. This is particularly evident in the surveyed organisations.

Figure 1 presents economic entities (according to the classification of the number of people employed) having standardised management systems. The results obtained in study 1 (S1) show that the ISO 9001 management system is the most widespread tool for shaping the quality of an organisation. The results in study 2 (S2) are slightly differently, indicating that with an increased population, HACCP with ISO 9001 are dominant pro-quality tools.



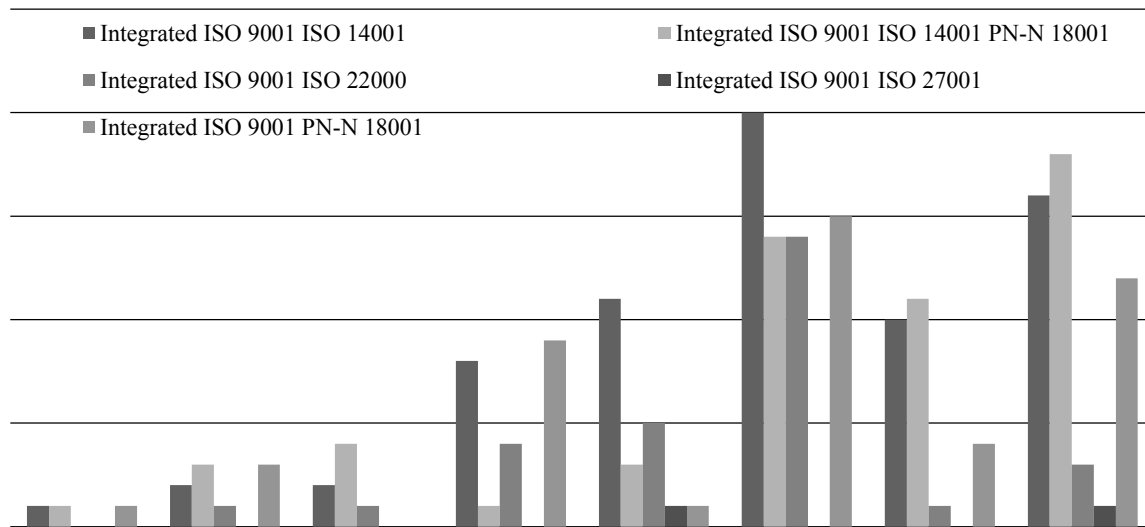
**Figure 1.** Population of standardised management systems in the surveyed organisations. Source: own study.

It should be noted that management systems in S1 occurred in 21.03% of trading activity, 26.19 in production and 52.78 in services. In S2, the share of the surveyed entities with management systems was as follows: 16.18% in commercial activity, 38.02% in production and 45.80% in service.

The conducted research has shown that having standardised management systems is one of many elements necessary for proper management of an organisation, guaranteeing a satisfactory level of quality accepted by stakeholders. The growing requirements and expectations of stakeholders, in specific industries, enforce continuous improvement of quality, also through the implementation of subsequent management systems. Integration of specialised management systems, as a comprehensive approach that enables solving problems related to continuous improvement and achieving specific benefits, is a "concept of sustainable development" achieved, among others, through:

- grouping, amalgamating or merging an enterprise or its elements of social community due to the similarity of production, goals, ideas, etc.,
- identification of common and specific elements (structures, processes, resources, goals, etc.),
- ensuring the achievement of technical, organisational and economic benefits – synergy effect.

Research confirms those claims also in organisations from the Central Pomeranian region, as shown in Figure 2.



**Figure 2.** Population of standardised integrated management systems in the surveyed organisations. Source: own study.

Figure 2 indicates that most of entities with integrated management systems function in all types of organisations, but medium and large entities are dominant.

Conscious behaviour of organisations that take up the challenge of, i.e. implementing, operating or integrating of standardised management systems, etc., while incurring significant costs, often arise from many premises that bring measurable organisational, marketing or economic effects.

The benefits and expectations that are most anticipated among respondents are presented in Figure 3 in study 1 (S1) and Figure 4 in study 2 (S2).



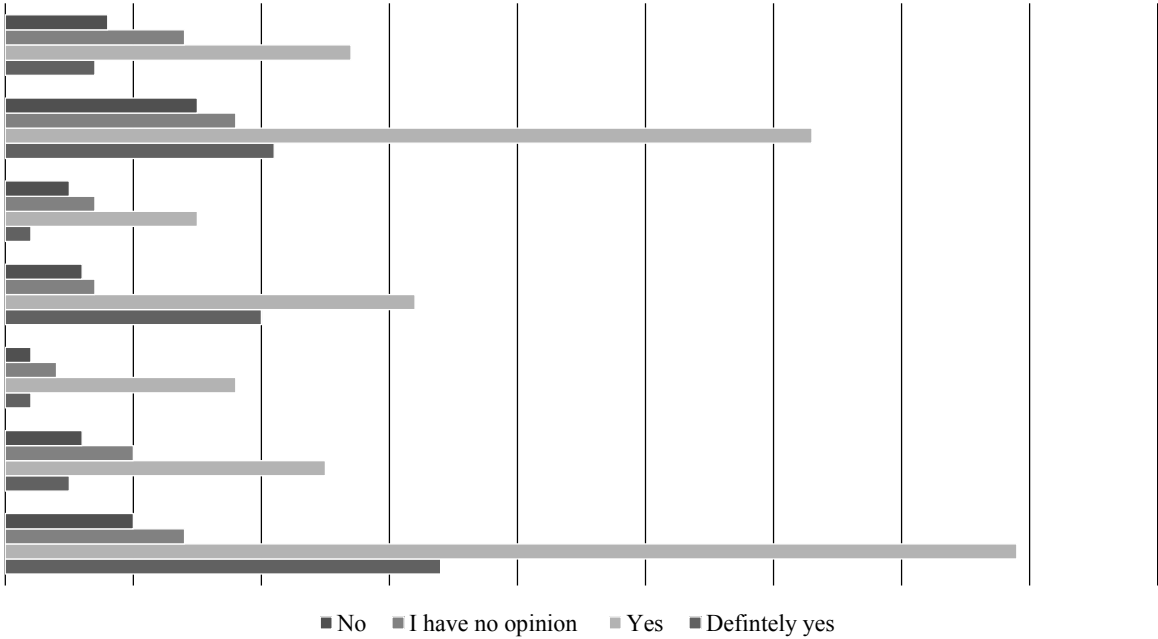


Figure 3. Respondents' expectations regarding the implementation of standardised management systems (S1). Source: own study.

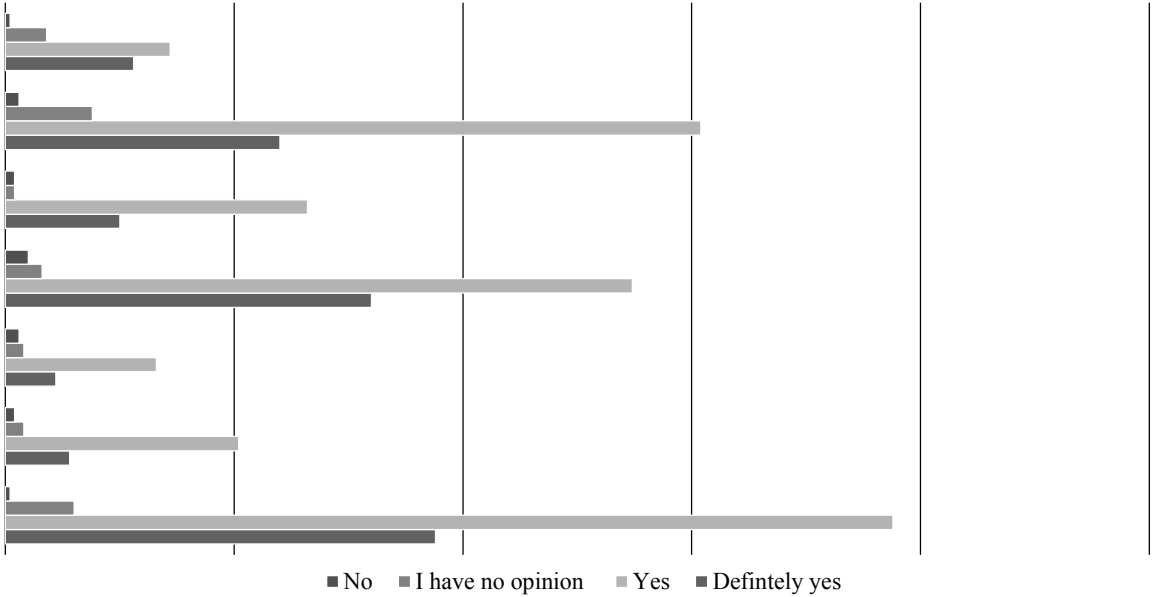
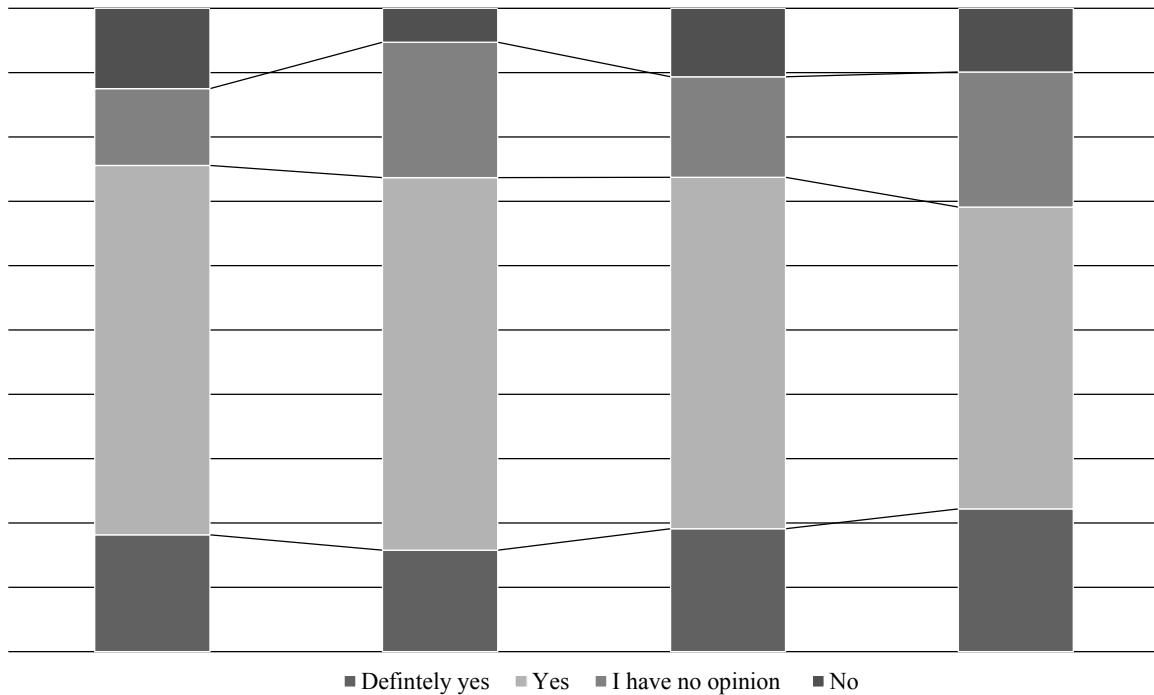
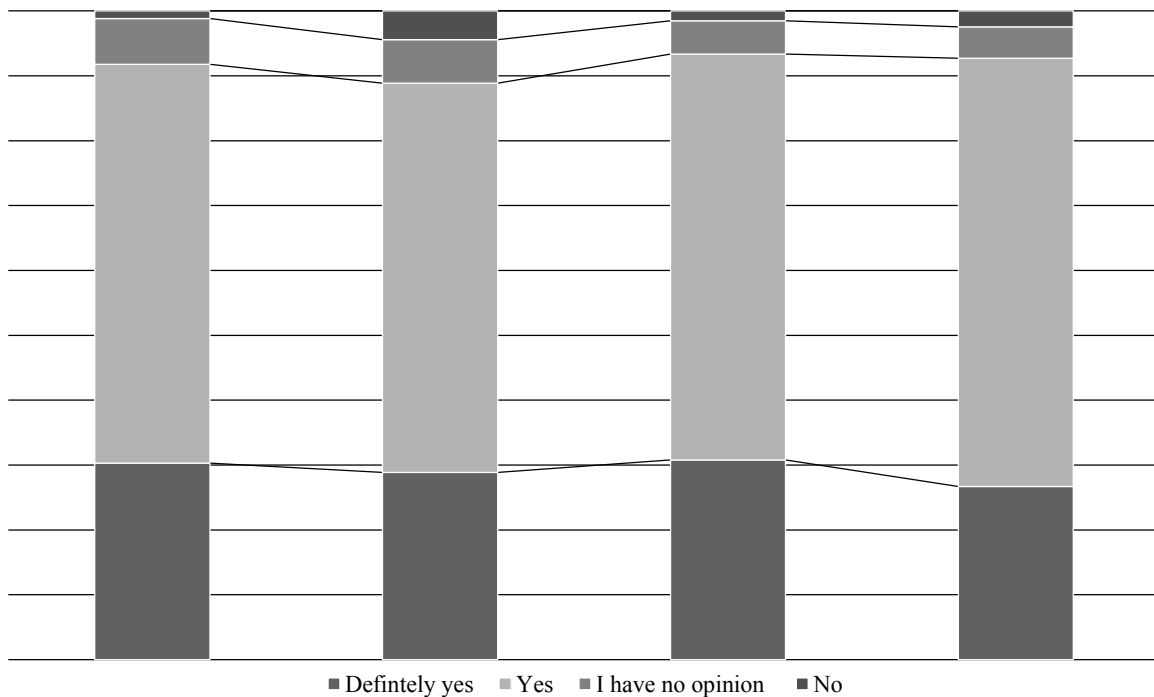


Figure 4. Respondents' expectations regarding the implementation of standardised management systems (S2). Source: own study.

When analysing the notion of safety in the process of quality development in the organisation within the framework of standardised management systems, it is necessary to emphasize the determining control sphere, which is presented in Fig. 5 in study 1 (S1) and Fig. 6 in study 2 (S2).



**Figure 5.** Safety as a part of standardised management systems (S1). Source: own study.



**Figure 6.** Safety as part of standardised management systems (S2). Source: own study.

Analysis of figures 1-6 indicates that standardised management systems are a fairly popular tool for shaping quality in an organisation. It can be concluded that systemic management will significantly determine the functioning and development of an organisation and increase the effectiveness of achieving goals, and increase the emphasis, inter alia, on:

- clients (stakeholders),
- employee awareness and commitment,
- improvement,
- monitoring and supervision.

## 5. Discussion of the results and conclusions

In modern economy, the need for a comprehensive approach to quality management is increasingly emerging. This is a key issue because in the economic environment there seems to be a huge number of stakeholders who influence the organisation with various methods, forcing it to constantly improve. This often leads to changes, which carried out in an inadequate manner in an organisation, may bring the company down. That is the reason why more and more companies, in order to minimise risk or complete collapse, decide to implement changes through standardised management systems. Voluntary international standards (universal application regarding the organisation's industry) allow in a clearly defined manner (standard requirements) to adjust the organisation and then implement a specific management system.

Pro-quality oriented enterprises, by improving quality in a continuous manner (also by using standardised management systems) are trying to build on the concept of TQM (Total Quality Management) (Łunarski, 2012; Grudzewski, Hejduk, 2004; Dahlgaard, Kristensen, Kanji, 2000). The TQM concept, focused on effectiveness, efficiency and safety, includes the following actions: identification and analysis of requirements, evaluation of obtained quality, forecasting the quality costs, minimisation and elimination of the cost sources as well as the creation and implementation of an appropriate pro-quality approach.

Regardless of the used standardised management system, organisations must rely on:

- customer orientation (stakeholders),
- process orientation,
- information orientation,
- constant improvement.

Customer orientation, on the one hand, is aimed at creating a new model of the work environment while at the same time changing the state of employees' awareness and on the other hand shaping the relationships, needs, satisfaction, etc. Activities focused on process management must be developed at all levels of the organisation, i.e. the operational, technological, control, planning and research, determining the effectiveness and efficiency of the changes, also in the aspect of continuous improvement. However, it should be noted that continuous improvement of quality requires appropriate and responsible management, where safety is one of the most important areas.

Safety management in an organisation, as part of quality improvement, refers to the areas of:

- information security – as part of the process activities will be achieved through the necessity to build and improve, among others: IT applications, quality measurement tools, system and hardware security, databases, etc.,
- monitoring the security of the pro-quality tasks implementation – as a part of preventive behaviour, supported by a clearly defined (conscious, responsible, trained, etc.) human factors as well as early warning system/systems,
- risk monitoring (control, analysis and improvement of data obtained, processed and transmitted),
- improvement of the processes responsible for the development of infrastructure, material, human resources, etc. guaranteeing proper conduct aimed at shaping quality, within standardised management systems.

In conclusion, the adoption of the improvement of quality as a direction of the organisation's development, by using standardised management systems has allowed the surveyed organisations to achieve market success. The success was considered specifically in the aspect of increasing the efficiency and profitability of an organisation, as well as market share.

This tendency is also noted by assessing the number of certificates issued under individual standardised management systems (Table 1).

**Table 1.**

*Number of certificates issued in the years*

Systems	Years	2010	2011	2012	2013	2014	2015	2016
ISO 9001	Total	1076525	1009845	1017279	1022877	1036321	1034180	1105937
	Europe	530039	459367	469739	458814	453628	439477	451415
	<b>Poland</b>	<b>12195</b>	<b>10984</b>	<b>10105</b>	<b>10527</b>	<b>9574</b>	<b>10681</b>	<b>12152</b>
ISO 14001	Total	239880	243393	260852	273861	296736	319496	346147
	Europe	103126	101177	111807	115764	119072	119754	120595
	<b>Poland</b>	<b>1793</b>	<b>1900</b>	<b>2014</b>	<b>2220</b>	<b>2208</b>	<b>2798</b>	<b>3184</b>
ISO/IEC 2700	Total	15626	17355	19620	21604	23005	27536	33290
	Europe	4800	5289	6379	7952	8663	10446	12532
	<b>Poland</b>	<b>229</b>	<b>233</b>	<b>279</b>	<b>307</b>	<b>310</b>	<b>448</b>	<b>657</b>
ISO 22000	Total	18580	19351	23278	24215	27690	32061	32139
	Europe	7083	7361	8307	9357	10181	11181	11083
	<b>Poland</b>	<b>629</b>	<b>573</b>	<b>659</b>	<b>640</b>	<b>626</b>	<b>677</b>	<b>701</b>

Source: own study, <https://www.iso.org/the-iso-survey.html>, 10.11.2017.

Quality improvement, involving the use of international norms of management, among others, created and is still creating a positive image of an organisation in the world and ensures high, repeatable quality of products and services to the stakeholders. It can be therefore assumed that the initiative to use standardised quality management systems has proved its worth and has directly contributed to shaping the pro-quality policy of sustainable organisation development. This development has had a particularly positive impact on the areas of production management, use of intellectual capital, information security and computerisation management, etc.

Quality, therefore, is an area that determines the expectations and requirements of customers as well as broadly understood management, including safety management. The results of the conducted research indicate that the actions undertaken to improve (shape) quality in an organisation, determine directly the safety activities. In practice, this means that there is a strong correlation between quality and safety, which determines the direction of pro-quality activity in the process management. The presented considerations and test results positively verify the research problems, stating that:

- organisations consciously use standardised management systems to increase the sense of safety of achieved quality (offered quality),
- Improving the quality in the organisation, as part of standardised management systems, guarantees the safety of quality.

## 6. Summary

Modern organisations striving for continuous improvement in all possible areas of their activity and operation, including management system, should pay particular attention to quality. The importance of the issues relating to quality shaping, as part of standardised management systems, is the topic of theoretical and empirical considerations and research. Shaping quality in the organisation, often requiring changes (organisational, mental, etc.) underlines the role of safety as a statistically significant dependence that ensures the success of carried out activities. Conducted theoretical and empirical analysis presented these interrelations in various aspects. Thus, there is an increased interest in the safety of quality (as the repeatability of the achieved level offered to the stakeholders) and safety management (as the level of meeting the needs of stakeholders in the area of food, information, product, risk reduction, etc.).

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