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The influence of quality management systems for improvement of logistics supply in Poland

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Abstract

Research background: ISO 9001 with its requirements gives a company a guidance on the definition of the quality management system architecture, based on the process approach and the indications for its continuous improvement. Despite the general emphasis to the benefits of implementation of ISO 9001 in the literature, there is a still lack of research concerning the actual impact of quality management systems for improving specific logistics processes. The research is focused on the Polish market because there is no research in the subject literature which concerns the impact of the implementation of quality management systems on the improvement of logistic processes in Polish enterprises.

Purpose of the article: The focus of this publication was to examine the impact of the implementation of the requirements of ISO 9001 for process improvement supply logistics.

Methods: Empirical studies were carried out in September and October 2014 on a group of 17 companies with implemented and certified quality management systems according to ISO 9001. The research tool was a questionnaire survey sent to management representatives (25 respondents) and workers (140 respondents). The surveys were supplemented with direct interviews with employees of the companies.

Findings & Value added: Based on the survey it can be stated that the quality management systems, according to ISO 9001, had a fairly large impact on improving procurement processes. This is particularly evident in areas including relationships with suppliers, quality control, workflow and communication, both internal and external. The positive aspects

achieved through the implementation of quality management systems due to the fact that the ISO 9001 standard in its commitments puts great emphasis on the organization of the procurement process.

Introduction

From the Author's observation it appears that many organizations realizing objectives related to logistics and efficient customer service, support themselves by the guidelines of standardized quality management systems. The implementation of quality management systems in the context of improving the logistics process seems to have a deeper justification, since both logistics and quality are aimed at acquiring common objectives oriented towards increasing the number of customers (Ho, 1997, pp. 275–283, Woźniak, 2017, pp. 455–460; Szopik-Depczyńska, 2015, pp. 53–65). A factor of special interest in this context is a quality management system according to ISO 9001. According to many authors, implementing the requirements of ISO 9001 offers companies a number of benefits such as (Psoomas *et al.*, 2013, pp. 149–164; Sampaio *et al.*, 2009, pp. 38–58; Domingues *et al.*, 2017, pp. 1252–1294):

- Access to new markets,
- Productivity improvements,
- Corporate image improvement,
- Product defect rate decreases,
- Market share improvement,
- Quality awareness improvements,
- ISO 9000 certification as a marketing tool,
- Definition of the personnel responsibilities and obligations,
- Customer relationship improvements,
- Delivery times improvements,
- Customer satisfaction,
- Internal organization improvements,
- Customer communication improvements,
- Nonconformities decreases,
- Customers' complaints decreases,
- Internal communication improvements,
- Product quality improvement,
- Competitive advantage improvement.

In addition, the ISO 9001 with its requirements gives a company a guidance on the definition of the quality management system architecture, based on the process approach and the indications for its continuous im-

provement. Therefore, the ISO 9001 standards enhance governing a company in crucial areas such as: the development of system documentation, management responsibility, employees' rights, methods of communication, maintenance management, acquisition and management, comprehensive implementation of the product or measurement and analysis and improvement (Czajkowska & Kadłubek, 2015, pp. 28–38; Zimon *et al.*, 2015, pp. 68–70; Witek, 2016, pp. 205–208; Gajewska & Grigoroudis, pp. 540–561; Zwolińska & Kubica, 2017, pp. 301–311).

Despite the general accentuation of the benefits of implementation of ISO 9001 in the literature, there is still no research concerning the actual impact of quality management systems for improving specific logistics processes (especially in Polish organizations). There are studies of a general nature concerning the relationship between quality and functioning of the supply chain, which provide the basis for further research and analysis:

- Flynn and Flynn (2005, pp. 3421–3436) concluded that there is a relationship between quality management and SCM and organizations that pursue quality and supply chain goals simultaneously achieve a competitive advantage that is difficult to imitate,
- Casadesus and Castro (2005, pp. 345–357) stated that it is not possible to affirm that ISO 9000 implementation totally favors SCM strategies. However, they found areas like relationship with suppliers, customer satisfaction, and customer complaints, which have improved with ISO 9000 implementation
- Prajogo, Huo and Han (2012, pp. 306–322), empirically tested a model of different aspects of ISO 9000 implementation in terms of their relationships with three key supply chain management practices (internal processes, supplier relationships, and customer relationships).
- As for Supply Chain and Quality organization's managers, there is a strong argument that for managers of Portuguese organizations with a Quality Management Systems ISO 9001 certification, Supply Chain Management is relevant to stakeholder satisfaction and for superior organizational performance (Fonseca & Lima, 2015, pp. 32–54).
- The issue of the functioning of the supply chain has been analyzed for many years, but still no clear systematic has been developed, when it comes to creating the conditions for supply chains, their performance goals or benefits from the implementation of the requirements of ISO 9001 standards (Olejarz & Gazda, 2016, pp. 425–431; Aung & Chang, 2014, pp. 172–184).

- Muñuzuri *et al.* (2013, pp. 47–495) claims that quality certifications help improve the management of logistics processes, but additional tools, possibly including a specific logistics management standard, are required.
- Bandyopadhyay and Spragu (2003, pp. 17–19) while analyzing the impact of quality systems on the functioning of the supply chain in the automotive industry, notice its positive impact on the final quality of finished products. Furthermore, they also reveal that the level of quality of products has an impact on the competitive position.
- Vanichchinchai and Igel (2011, pp. 3405–3424) found that the complex quality management significantly affects the improvement of supply chain management while implementation of ISO 9001 in some respects enhances the processes realized in it.

According to the Author, on the basis of the presented results it seems appropriate to conduct studies on the effect of different quality management systems for the betterment of selected subsystem logistics. Therefore, in the article, studies concerning the impact of the quality management system for procurement logistics will be presented. Procurement logistics is a subsystem of the logistics involved in the first phase of the movement of goods. This step involves the flow of raw materials, semi-finished products, components, and other means of property, and proceeds from the supplier on the market for the acquisition of the magazine input in the company. The key role of logistics supply is mainly due to the fact that it determines the timely synced processes of production with purchase orders of raw materials required to produce a finished product. To achieve that, an organization dedicates considerable financial resources (Malindzakova *et al.*, 2015, pp. 1260–1264; Zizka *et al.*, 2016, pp. 60–62). Errors made at this stage will adversely affect the effectiveness and efficiency of production logistics and distribution. Therefore, the support subsystem supply seems to be an extremely important task for any company. When considering the impact of the quality management systems to improve the logistics supply, it can be stated that ISO 9001 will positively impact especially on the implementation of the processes associated with:

- Ensuring the expected quality of the purchased goods.
- Selecting and maintaining beneficial relationships with suppliers.
- An improvement of forms of quality control.
- Conscious obtaining of components most fully corresponding to the requirements of customers.

Research methodology

The aim of this publication was to examine the impact of the implementation of the requirements of ISO 9001 for process improvement supply logistics. Selecting the operation was dictated by the following reasons:

- The ISO 9001 despite the fact that in recent years it has lost much of its popularity, is still the most commonly-implemented quality management system in the world. This is due to the fact that the main goal of its creators was to develop a universal system addressed to any type of organization. Initially, the quality management systems in accordance with ISO 9001 standards were implemented in large industrial enterprises. Today, they are more popular in all types of organizations, including those that carry out any activity in logistics (Zimon, 2017, pp. 3–16).
- ISO 9001 International Standards can be an excellent start to TQM, if it is interpreted in a way that encourages the company to begin the process of continual improvement and aligns its entire people toward that goal.
- Logistics supply has a very large impact on subsequent logistic subsystems, since its normal operations depend on the efficiency of the entire supply chain and meet customer requirements (Zimon & Bednarova, 2016, pp. 465–470).
- Standardized quality management systems of the assumptions supporting activities that affect the quality of the acquired assets, the study aims to answer the question whether these assumptions work in practice?

Empirical studies were carried out in September and October 2014 on a group of 17 companies with implemented and certified quality management system according to ISO 9001. The research was conducted at randomly selected Polish companies operating in the sanitary and construction sector in south-eastern Poland. Choosing the organization was based on data from the Central Statistical Office. The research tool was a questionnaire survey sent to management representatives (25 respondents) and workers (140 respondents). Surveys were supplemented with direct interviews with employees of the companies. The level of return of the questionnaires was 21 %.

Presentation and analysis of research results

The first question regarding the impact of the quality management system to improve supply subsystem was of a general nature, and was addressed to both groups representatives of management and employees (Fig. 1.).

The distribution of responses shows that among the representatives of the two studied groups the dominating response was the one indicating that the quality management systems contribute to improving the supply subsystem. Executives pointed out that since the implementation of ISO 9001 improved procedures related to the evaluation and selection of suppliers, narrowed and improved processes related to quality control, and by developing new procedures arranged in a large part of the procurement process. The study stressed that ISO 9001 in particular had a positive effect on the selection and monitoring of suppliers through introducing audits, a common approach to addressing the financial, technological, qualitative improvement of information channels, and continuous improvement of mutual relations. In turn, employees frequently suggested that through a clear division of tasks and responsibilities they have gained a better comfort of working, and also noted that the leadership decided to streamline and modernize infrastructure. Only 12% of management representatives and 16% of employees do not notice the relationship between the implementation of the requirements of ISO 9001 and the improvement of procurement processes.

In order to deepen the research process, respondents were asked to determine the influence exerted by a standardized quality management system for individual supply processes (Fig. 2).

According to representatives of management, quality management systems have received the highest marks in the area of quality control, strengthening relationships with suppliers and further improvement of logistics subsystems. Their choice was justified as follows:

- Ownership of standardized quality management systems by both suppliers and customers allows for certain restrictions to control the initial sourced components and the diversion of responsibility for the quality of supplies to suppliers, which affects closer relations,
- Implementation of standardized quality management systems in the supply chain facilitates the creation of a common strategy, and directs the organization to implement a similar purpose. Moreover, ISO 9001 stimulates the development of long-term cooperation between organizations and also fosters the development of new organizational and technical solutions to improve flows in the supply chain. In addition, the implementation of ISO 9001 runs some mechanisms that specify how carrying out the tasks in the supply chain define the manner in which the cells in specific manufacturing processes of products or provision of services.
- System requirements also include other subsystems logistics to improve their integration and proper conduct.

- ISO 9001 standard requires from both producers and suppliers to identify, plan, supervise and optimize their processes directly affecting the quality of the finished products. Compliance with the requirements of standardized quality management system will force the development of procedures, improve the infrastructure, and determine the criteria for the proper implementation of sub-processes. In addition, compliance with the requirements of the system will ensure repeatability of action and will contribute to increase the reliability of the product.

Employees, on the other hand, have found that the quality management systems have had a positive impact on the completeness of supply, improving the exchange of information and the support of the production process. The employees frequently suggested that overall improved process of supply, introduced sensible standards for the exchange of information both in the supply chain, as well as within individual cells of the organization and by introducing the concept of "internal customer" they were more able to adapt to the requirements of the production department employees.

The final aspect of the research process was to determine the effect of a standardized quality management system to minimize the number of errors and mistakes (Fig. 3). This question was addressed only to the representatives of management, because their functions allow them to access full documentation related to complaints.

The distribution of responses shows that over 60% of respondents noticed a definite improvement in the functioning of the procurement process while minimizing the number of flaws and inconsistencies. Respondents emphasized that:

- Quality management systems sealed the inspection process.
- In case of occurrence of potential errors they can quickly get to the root of the problem (identification requirement).
- New procedures have minimized the number of mistakes made by employees of the organization (errors in the contract, deficiencies, incompleteness).
- Suppliers who have also implemented a standardized quality management systems efficiently execute the orders.
- After the implementation of system requirements, there is significantly improved control of the purchased material resources.
- Implementation of standardized quality management system influences the development of new and improvement of existing channels of information flow between the customers and the various links in the supply chain.
- ISO 9001 standard strongly emphasizes the importance of the proper selection of suppliers based on their ability to meet the requirements of

the organization and points to the need to maintain partnership relations with them.

- Implementing the requirements of ISO 9001 obliges management to determine the extent and form of control over suppliers.

Conclusions

Based on the survey, it can be stated that the quality management system according to ISO 9001 has a fairly large impact on improving procurement processes. This is particularly evident in the areas involving relationships with suppliers, quality control, workflow and communication, both internal and external. Positive aspects have been achieved through the implementation of quality management system, due to the fact that the ISO 9001 standard in its commitments puts great emphasis on the organization of the procurement process. The goods that organization supplies must meet specified purchase requirements, including approval processes semi-finished products, qualifications and functioning of the quality management system provider. It is necessary, therefore, to carry out the evaluation and selection of suppliers, to measure the quality of purchased components by trained personnel using appropriate control systems.

It should, however, be mentioned that a small proportion of respondents (oscillating in the range of about 10–15%) spoke very critically on the implementation of ISO 9001 in the context of improvement of logistics processes. The main charges which have been formulated may include:

- the relatively high costs in relation to the benefits achieved,
- introducing the documentation, which is not always needed
- formalized systems which limit the speed and flexibility of action,
- ISO 9001 is no longer an argument that attracts customers,
- some employees stressed that the leadership of positive comments on the standardized quality management system does not show sufficient commitment to maintain and improve the system.

In conclusion, it is worth noting that only recently (September 2015) a new standard ISO 9001 has been released: 2015 to be less prescriptive and more focused on the management of the entire supply chain, requires a greater commitment of the management is also less bureaucratic and more friendly to the organization. If, in practice, this standard is actually in line with the announcements, it may mean that most of the criticisms presented above will cease to be justified.

The research has been exploratory in nature and as such it has been subject to some limitations. Firstly, although the sample size of the question-

naire survey is satisfactory, a larger sample size could have provided a broader assessment, deeper insights and a firmer basis for generalisation. Secondly, the focus of the study is exclusively on the Polish market. For this reason, the validity of evidence presented in this study is limited to the Polish market situation. Accordingly, one must exercise caution in extrapolating the results geographically.

The research presented in the publication will be continued by the author and focused on establishing relations and links between the concepts of quality management, logistics processes and the development of technology and sustainable development.

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Annex

Figure 1. The impact of the quality management system to improve supply subsystem

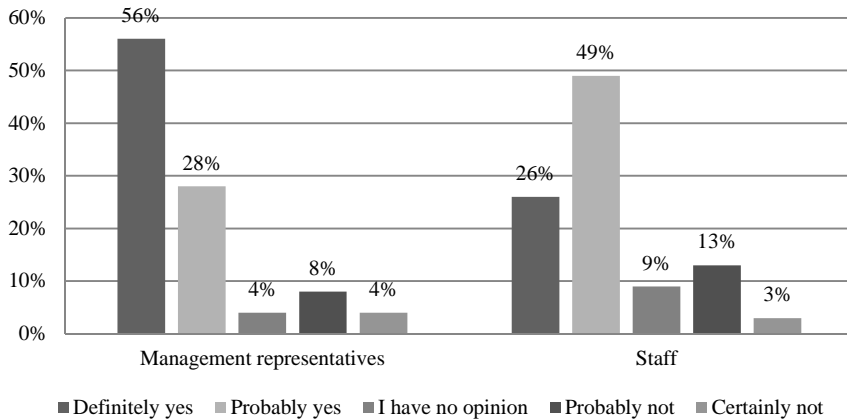


Figure 2. The impact of the quality management system to improve the individual processes

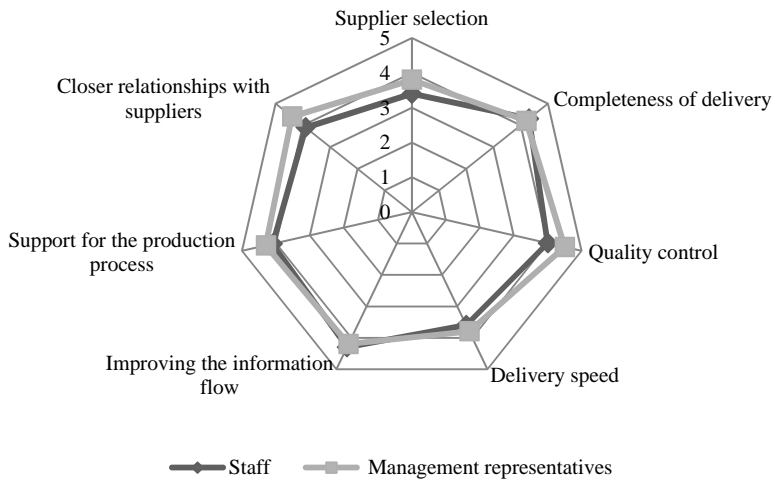


Figure 3. The impact of the quality management system to minimize the number of errors and mistakes

