

Perception of Benefits and Barriers Associated with the Management Systems Integration - A Comparative Study of Slovak and Ukrainian Organizations

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Abstract – The article discusses the benefits and barriers associated with the implementation of integrated management systems. The results of a questionnaire survey conducted in Slovak and Ukrainian companies with implemented IMS confirm that Ukrainian and Slovak companies generally perceive the introduction of IMS positively, regardless of the length of the period (number of years) IMS is implemented. The most frequently reported benefits were (1) increased quality of products and services, (2) a competitive, and (3) customer acquisition and retention. With regard to barriers perceived, Ukrainian companies generally perceive the introduction of IMS positively, although slightly larger barriers were overcome by larger companies, the opposite was true for Slovak companies. However, the dependence of the perception of barriers in the IMS implementation on the size of the company was not statistically proven.

The most frequently reported barriers were an administrative burden and a lack of tools for IMS auditing and evaluation. The study expands the empirical evidence on perceived benefits and barriers of IMS implementation and can serve managers in their effort to overcome the difficulties and take full advantage of IMS implementation.

Keywords – Integrated management systems, ISO standards, organization, benefits, barriers.

1. Introduction

In the modern economy, the main attention is paid to the process of development of the organization, increasing the efficiency of its activities, ensuring the satisfaction of consumer needs and expectations. In this context, management trends such as professionalism, informatization, socialization, and integration of management processes have begun to develop.

Many organizations have already implemented or are implementing management systems according to internationally recognized standards such as ISO 9001 (Quality Management System), ISO 14001 (Environmental Management System), ISO 50001 (Energy Management System), ISO 45001 (OHSAS 18001) (Safety Management System and occupational health), ISO 22000 (Food Safety Management System), ISO / IEC 27001 (Information Security Management System in an organization) and/or others [4]. These management systems often work independently of each other. However, all systems have certain elements in common that can be managed comprehensively.

To achieve the best results, it is possible to define and use the necessary unity of these systems within the overall management system of the organization.

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The implementation of such – so-called integrated management systems (IMS) is associated with a number of benefits.

2. Previous Empirical Research

A wide range of studies in management systems has been devoted to the benefits, motivators, and positives associated with the integration of management systems. The most common benefits that we encounter in the literature include the improvement of organizational efficiency (reduce duplicity or redundancy of tasks, documentation, human efforts, time, etc.) [1], [12] improvement of internal communication, company image for external stakeholders, competitiveness, as well as reduction of the costs of managing each system individually [7], [15]. An empirical study of IMS by Zeng et al. [14] reports decreased paperwork, management cost, and complexity of internal management as well as simplified certification process and support of continuous improvement as the main benefits of IMS implementation.

A study by Carvalho et al. [2] performed in the Brazilian constructing industry provides evidence of several benefits, including improvement of routine management in the first place and financial savings as the smallest benefit. According to [3], proper integration of management systems is accompanied by decreased bureaucracy, management costs, a simplified certification process, better internal management, and facilitation of continuous improvement.

Based on the case study in the airline, [5] reports cost savings, better use of resources, improved internal communication, stronger customer orientation, and employee motivation as the main benefits of IMS implementation. At the same time, however, he points out that obtaining these benefits is conditioned by several factors that affect the integration process.

Vashishth et al. explore IMS implementation in Indian small and medium-sized enterprises. They link challenges and motivation to implement IMS with IMS maturity and its impact on operational performance and find differences between intrinsic and extrinsic motivation for IMS implementation and level of IMS maturity. The study also confirmed that a higher level of IMS maturity leads to better operational performance [13].

The presented paper aims to examine more thoroughly the benefits and barriers that organizations perceive in connection with the IMS application. The contribution of the paper to the current knowledge base is twofold: in addition to mapping the benefits and barriers associated with the use of IMS, we examine the relationship between the length of IMS implementation and perceived benefits

and the relationship between the size of the organization and the barriers it perceives. The research was mirrored in two countries - Slovakia and Ukraine, and a comparison was made between these countries.

3. Methodology and Data

Research Design

The method of a non-standardized online questionnaire was chosen for the research purposes. The target group of the research consists of companies that have an integrated management system implemented. Taking into account the main goal of the research and the target group, a database of companies with an integrated management system was developed. The database contains information on the management systems that are implemented in the company, the industry in which the company operates, country/region and contact details (telephone and email). In order to be able to reach the greatest number of respondents in the two countries, online communication was chosen for the distribution of the questionnaire. The questionnaire was distributed in the first quarter of 2021.

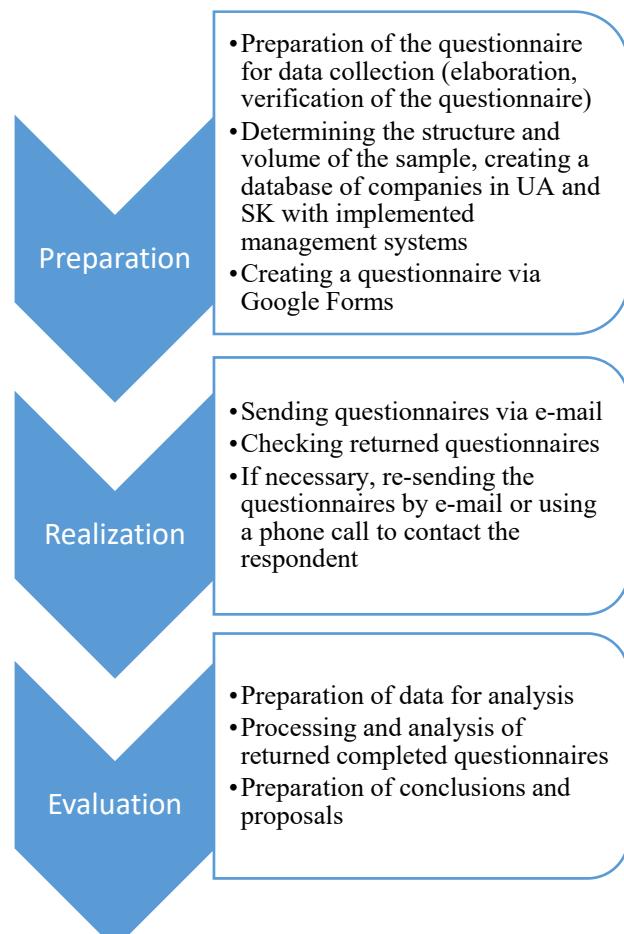


Figure 1. Research design

The research consists of three main stages. Chronological order and description of the research stages is provided in Figure 1.

The basic method of data sorting and arranging was used for data processing and further investigation. The results obtained through the Slovak and Ukrainian questionnaires were processed in MS Excel. The results of the questionnaire survey were interpreted using selected statistical and analytical-synthetic methods.

Research Sample

The questionnaire was sent to 83 Slovak organizations and 76 Ukrainian organizations; the completed questionnaire was returned from 90 organizations (47 Slovak and 43 Ukrainian), the total return of the questionnaire is 56.6%. 20 organizations (7 Slovak and 13 Ukrainian) did not meet the conditions of the research and were excluded from the research because they did not have an IMS fully implemented. Thus, the research sample consists of a total of 70 respondents (40 Slovak and 30 Ukrainian).

In terms of size, medium-sized enterprises dominated in Slovakia (36.17%) and large enterprises in Ukraine (60.47%). Enterprises focused on industrial production had the largest share in both countries, exactly 21.28% in Slovakia and 44.19% in Ukraine.

85.11% of Slovak companies and 69.77% of Ukrainian companies have an integrated management system. The certified system of environmental management was the most represented management system in the group of Slovak companies, while in Ukraine the quality management systems dominated. The occupational health and safety system was the third most frequent management system in both countries.

Hypotheses and Methods of Statistical Analysis

In order to determine the benefits and barriers that organizations in Slovakia and Ukraine perceive in connection with integrated management systems, we set these hypotheses:

H 1: Organizations that have had IMS implemented for longer (more than 5 years) will perceive more benefits associated with IMS implementation than organizations that have only recently implemented IMS.

H 2: Large organizations (with more than 250 employees) will perceive fewer barriers associated with the implementation of an IMS than medium-sized organizations (with 50 to 249 employees), small organizations (with up to 49 employees), and micro organizations (with employees from 1 to 10).

We verified the normality of the data using the D'Agostin test, which is suitable for random selection of a large range ($30 \leq n \leq 100$). We chose the significance level ($\alpha = 0.05$) and tested the null hypothesis H0 that the given selection is from a normal distribution ($p > \alpha$) versus the alternative hypothesis H1, that it comes from a non-normal distribution, so the data are not normally distributed ($p < \alpha$).

The statistical method we used to verify the hypotheses was the Mann-Whitney test. According to [8], the Mann-Whitney U test is used to compare the medians of two independent samples.

The test answers the question of whether the difference between the medians of the two groups is statistically significant (i.e., whether there is a relationship between the variables) or can only be random (i.e., there is no relationship between the variables). The null statistical hypothesis about the equality of all medians based on the calculated p-value is tested. Ordinal variables are measurable variables on a sequential scale, i.e., it is possible to determine which of the values is greater:

$$U = R_1 - \frac{n_1(n_1+1)}{2}$$

where: R = sum of the sequences in the sample; ni = observed abundance in category i.

4. Results and Discussion

Relationship between the length of IMS implementation and the perceived benefits of IMS implementation

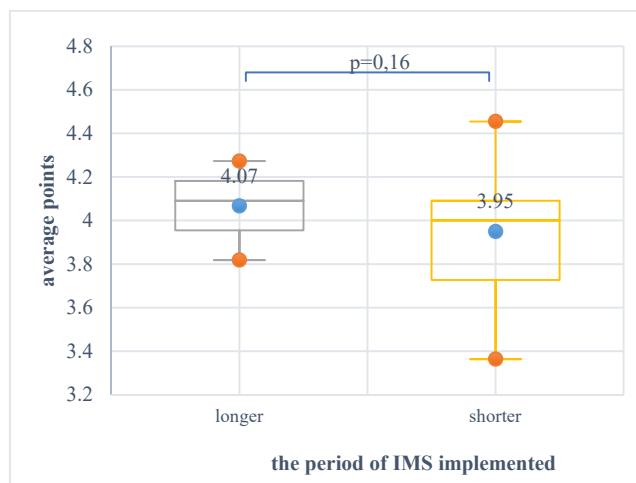
Within Hypothesis 1, we assumed that companies that have IMS implemented for longer will perceive more of the benefits associated with IMS implementation than organizations that have recently implemented IMS and record the costs involved.

We examined this hypothesis for both countries and then compared the results.

Slovakia

An IMS in Slovakia has been implemented in 85% ($n = 40$) from the surveyed companies ($N = 47$). For this reason, we excluded 7 companies from the verification of hypothesis 1. In terms of the length of IMS implemented, 20% ($n = 8$) of companies have implemented IMS for less than 1 year, 42.50% ($n = 17$) of companies have IMS implemented for 1 to 5 years. These two categories create a group of organizations with a shorter period of IMS implementation. Another group with a longer period of IMS implementation is represented by 37.50% ($n = 15$) of the companies that have IMS implemented for more than 5 years.

The overall average of the answers to the question concerning the perceived benefits associated with the IMS implementation in Slovak companies was at the level of 3.99 ± 0.85 . Based on a performed normality test suitable for $30 \leq n \leq 100$, i.e., the D'Agostin test we found that the p-value is less than 0.05 ($p < 0.0001$), therefore the data are not normally distributed. Based on this fact, we chose a nonparametric statistical method suitable for verifying hypothesis 1, the Mann-Whitney test. This test is suitable for two groups of unpaired data (shorter period of IMS implemented / longer period of IMS implemented).



*Figure 2. Mann Whitney test of verification of hypothesis 1 in SK
(Source: own processing)*

As can be seen from the Mann-Whitney test (Figure 2.), the average response rate for companies that have a longer IMS system in place ($n = 15$) was 4.07 ± 0.14 points. For companies that have only recently implemented the IMS, i.e., over a period of up to 5 years ($n = 25$), the mean response was lower (3.95 ± 0.26).

After recoding the answers, we can state that the higher the average number of points, the better perceived the benefits associated with the implemented IMS in the organization. Although organizations with longer IMS implemented perceive more the benefits associated with IMS implementation than organizations with a shorter time of IMS implemented, based on the resulting p-value (0.16), which is greater than the specified level of significance alpha ($\alpha = 0.05$), we must accept null hypothesis 1 for the Slovak Republic, in which we assumed that "the period of the implemented IMS **does not affect** the perception of the benefits that these systems bring". It follows that Slovak companies generally perceive the introduction of IMS positively and the period (number of years) does not have a statistically significant effect on the

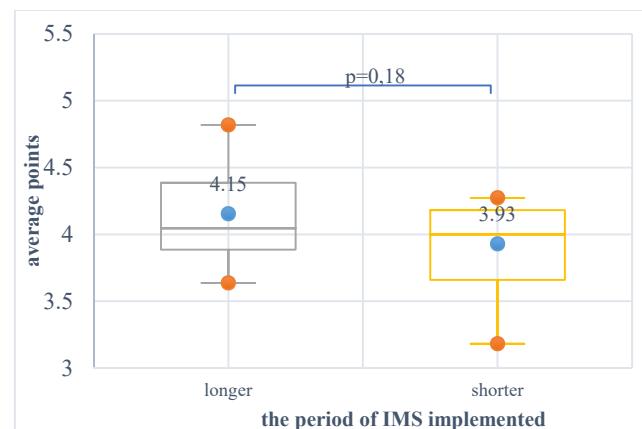
perception of the benefits that result from the IMS implementation.

Ukraine

In Ukraine, only 69.77% ($n = 30$) organisations have implemented IMS, from the total surveyed companies ($N = 43$).

In terms of length of implementation, 16.67% ($n = 5$) of Ukrainian companies have IMS implemented for less than 1 year, 30% ($n = 9$) of companies have IMS implemented for 1 to 5 years and 53.33% ($n = 16$) of companies has an IMS system in place for more than 5 years.

The overall average of the answers to the question dealing with the perception of the benefits associated with IMS among Ukrainian companies was 4.05 ± 0.93 . Based on a performed normality test we found that the p-value is less than 0.05 ($p < 0.0001$), therefore the data are not normally distributed. Therefore, we chose a nonparametric statistical method - the Mann-Whitney test - suitable for verifying hypothesis 1 in Ukraine.



*Figure 3. Mann Whitney test of verification of hypothesis 1 in UA
(Source: own processing)*

The Mann-Whitney test (Figure 3.) shows that the average response rate for companies that have a longer IMS system in place ($n = 16$) was 4.15 ± 0.36 points. Ukrainian companies that have implemented the IMS system for a shorter period, i.e., over a period of up to 5 years ($n = 14$), the mean response rate was lower at 3.93 ± 0.33 . From this perspective, we can sum up that similarly as in Slovak enterprises, the longer organizations have implemented IMS the more benefits they perceive. However, based on the resulting p-value of the Mann-Whitney test (0.18), which is greater than the determined level of significance alpha ($\alpha = 0.05$), we must accept null hypothesis 1 for Ukraine. In the null hypothesis, we assumed that "the period of the implemented IMS **does not affect** the perception of the benefits that these systems bring".

As a result, both Ukrainian and Slovak companies generally perceive the introduction of IMS positively, regardless of the length of the period (number of years) IMS is implemented. Our calculation did not show statistical significance for the perception of the benefits that result from the implementation of IMS with respect to the time period.

The most frequently perceived advantages associated with the implemented IMS in Slovak and Ukrainian organizations include: increasing the quality of products and services (SK 4.60, UA 4.60), gaining a competitive advantage (SK 4.60, UA 4.53), customer acquisition and retention (SK 4.43, UA 4.47), improved company image (SK 4.23, UA 4.40) and improvement of production processes and services (SK 4.10, UA 4.33). On the other hand, lower costs for the overall management of the organization were listed as the least perceived advantage. This finding is consistent with those of Carvalho et al. who also reported financial savings as the smallest benefit [2].

The relationship between the size of the company and the perceived barriers to the introduction of IMS

Within the second hypothesis, we assumed that larger companies (over 50 employees) will perceive fewer barriers associated with the implementation of an integrated management system than smaller companies (up to 50 employees).

Slovakia

Depending on the number of employees, the survey sample had the following structure: micro-enterprises (1-10 employees) represented 5.00% ($n = 2$), small enterprises (11-50 employees) represented 17.50% ($n = 7$) and medium-sized enterprises (51-250 employees) accounted for 40.0% ($n = 16$). For the purposes of further analysis, we categorize these as a group of small enterprises, which represent 62.5% ($n = 25$) of companies. The group of large enterprises with 251, and more employees makes up 37.50% ($n = 15$).

The overall average of the answers to the question concerning the perception of barriers associated with the introduction of IMS in Slovak organizations was at the level of 3.46 ± 1.10 . Based on the performed normality test suitable for $30 \leq n \leq 100$, i.e., the D'Agostin test, the calculated p-value is less than 0.05 ($p < 0.0015$), therefore the data are not normally distributed. Based on this fact, we chose a nonparametric statistical method suitable for verifying hypothesis 2, i.e., the Mann Whitney test. This test is suitable for two groups of unpaired data (small company / large company).

As follows from the Mann-Whitney test (Figure 4.), the average value of responses in small Slovak companies ($n = 25$) was 3.48 ± 0.42 points. For large Slovak companies, with the number of employees over 251 ($n = 15$), the average value of responses was slightly lower (3.42 ± 0.27). After recoding the answers, we can say that the higher the average number of points, the greater the barriers. Based on the resulting p-value of the test (0.45), which is greater than the set level of significance alpha ($\alpha = 0.05$), we must accept null hypothesis 2 for the Slovak Republic, in which we assumed that the size of the organization **does not affect** the perception of barriers associated with the implementation of IMS.

It follows that Slovak companies generally perceive the implementation of IMS positively, although slightly larger barriers were perceived by small companies. The dependence of the perception of barriers of IMS implementation on the size of the company in terms of the number of employees was not statistically proven. Larger companies perceive fewer barriers, mainly due to better technical, economic, personnel and other options.

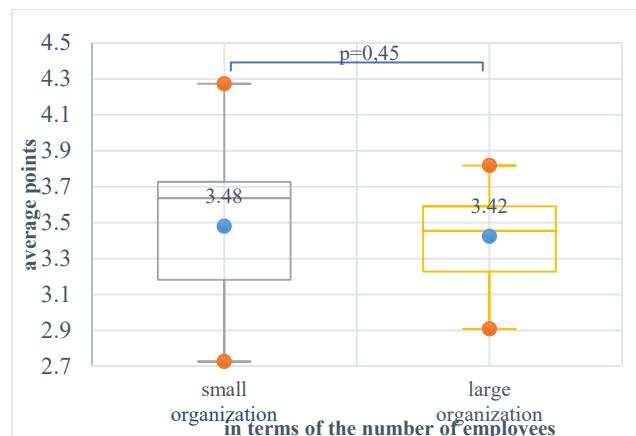


Figure 4. Mann Whitney test of verification of hypothesis 2 in SK
(Source: own processing)

Ukraine

In terms of the size of the organization, the structure of the Ukrainian sample was as follows: 5% ($n = 2$) small enterprises (11-50 employees), 15% ($n = 6$) medium-sized enterprises (51-250 employees). There has been no representative of a micro-enterprise (1- 10 employees). Within hypothesis 2, these three categories of enterprises form a group of small companies ($n = 8$). Within the group of "large companies with 251 or more employees, 55% ($n = 22$) of companies from the Ukrainian side participated in the survey.

The overall average of the answers to the question asking about the perceived barriers to the implementation of IMS by Ukrainian companies was 3.48 ± 1.07 .

Based on a performed normality test we found that the p-value is less than 0.05 ($p < 0.0001$), therefore the data are not normally distributed. Therefore, we chose a nonparametric statistical method - the Mann-Whitney test - suitable for verifying hypothesis 2 in Ukraine.

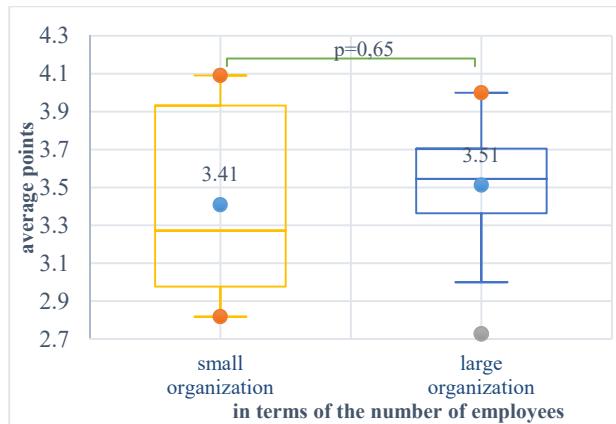


Figure 5. Mann Whitney test of H2 verification in UA
(Source: own processing)

Based on the results of the Mann-Whitney test (Figure 5.), the average response rate for small Ukrainian companies ($n = 8$) was 3.41 ± 0.53 points. For large Ukrainian companies ($n = 22$), the average value of responses was higher (3.51 ± 0.31). When recoding the answers, we can say that the higher the average number of points, the greater the barriers. Based on the resulting p-value of the test (0.65), which is greater than the specified level of significance alpha ($\alpha = 0.05$), we must accept null hypothesis 2 for Ukraine, in which we assumed that the size of the organization does not affect the perception of barriers associated with the implementation of an integrated management system. It follows from the above that Ukrainian companies generally perceive the introduction of IMS positively, although slightly larger barriers were overcome by larger companies, the opposite was true for Slovak companies. Despite the difference with the Slovak Republic, even in this case, the dependence of the perception of barriers in the IMS implementation on the size of the company in terms of the number of employees was not statistically proven.

The results of the research show that Ukrainian and Slovak organizations during the IMS implementation most often encounter problems such as increased administrative burden in creating documentation (SK 4.18, UK 4.20), lack of tools for auditing and evaluation of the IMS (SK 4.08, UA 3.77), lack of a standard for IMS (SK 3.78, UA 3.97), insufficient orientation in the requirements of individual directives (SK 3.73, UA 3.97). Incompatibility within existing standards was ranked last in the list of barriers (SK 2.15; UA 2.43). This

contradicts the findings of [6], [10] who report on the difficulties associated with the integration of management systems due to the lack of specialized support necessary for a proper implementation and certification of the IMS within the organization where the incompatibility of the models is the variable that contributes the most to this factor. Our current finding confirms that efforts to unify the standard structure of individual management systems, which culminated in 2015 with the application of the SL annex in the revision of ISO 9001 and ISO 14001 standards, have borne fruit and are currently not perceived as a significant obstacle by organizations.

5. Conclusions

Integration is one of the most important processes in the modern world. An integrated management system is a universal and effective management tool for achieving organizational goals in the field of quality, environmental protection, energy efficiency, safety, health, and others. The implementation of IMS allows to improve business management efficiency and, on this basis, to create conditions for sustainable development and ensure the competitiveness of products and services, reduce overall costs, meet consumer needs more effectively [9], [11].

The main objective of this study was to shed light on the advantages and disadvantages associated with the implementation of integrated management systems. At the same time, the relationship between perceived benefits and the length of IMS implementation in the organization was examined. We assumed that the longer the company has implemented IMS, the more benefits it will perceive in connection with these systems. With a positive surprise, we can say that companies perceive several benefits associated with IMS, regardless of the length of the implemented IMS. Even organizations with freshly implemented IMS perceived and reported the benefits of systems integration. We also assumed that small and medium-sized enterprises would perceive more barriers than large enterprises. However, the results did not show statistical significance between these variables. Similarly, we conclude that the perception of barriers of IMS implementation is not conditioned by the size of the company.

The main advantages of IMS include:

- the volume of documentation in an integrated system is smaller than in several systems implemented separately;
- the costs of implementing and operating an IMS are lower than when implementing and operating several systems separately;

- an integrated management system provides greater coherence throughout the company;
- creating and implementing an IMS is less demanding than creating and implementing several management systems separately.

Comparing the results of research in the two countries, it can be stated that one country has better experience with the implementation of management systems and their integration, another country has slightly worse experience.

In general, organizations in the two countries face similar difficulties and barriers to the integration and implementation of the IMS, but nevertheless, most of them perceive many benefits and in most cases consider the experience of management systems integration to be positive and very beneficial for organizations in both Slovakia and Ukraine.

The presented study brings several findings and expands the knowledge base related to management systems and their integration. At the same time, however, it raises a number of other issues that may be the subject of further research, e.g. effectiveness of IMS implementation and evaluation of its benefits for the organization and its stakeholders, integration of IMS documentation - as the most frequently reported problem, etc.

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