

Benefits of Process Management and their Impact on Performance Improvement in the Slovak Business Environment

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Abstract—The article presents the results of the research carried out in the Slovak Republic's enterprises in 2017. It deals with the application of process management, its tools, procedures, methods and their impact on improving the quality of processes and performance of enterprises measured through ROE. Process Improvement and Quality improvement focuses on the causes of negative results, changing internal processes to streamline these processes and bring value to the customer, making it more satisfied. The process approach enables, in addition to improving process performance, a competitive advantage through company flexibility, eliminating inefficient changes, increasing production quality and reducing costs, which clearly leads to increased efficiency and overall business performance.

Keywords—*process management, quality, performance, improvement*

I. INTRODUCTION

The decisive driving force behind economic activity in the market economy is the business and their business activities. Currently, companies must act on the incentive of satisfying increasingly demanding needs and requirements of customers. Success of a company depends on the efficient use of resources, its innovative strength, productivity, reducing delivery times and respecting delivery dates, on good quality products and services etc. Globalization, rapid developments in technology, increasingly strengthening competition forces businesses to use new, modern management approaches besides the traditional ones. Such approach also includes process management that helps to improve the efficiency of processes by using modern methods of quality improvement. To maintain the ability of companies to compete, it is important to adapt the process management of a company in order to secure direct and daily management, measurement, quality control and thus secure improvement of processes at all levels. The aim of this contribution is to present a positive effect of the use of quality management tools and procedures to improve the processes and performance of businesses in the Slovak business environment.

II. MATERIAL AND METHODS

Authors defines the process as an organized group of interrelated activities, passing through one or more departments within or outside of the company, in which inputs are consumed and outputs produced that have value

for the customer [1], [2]. Change is a manifestation of the development process and currently, there is a great pressure on the need for change.

The process is a sequence of partial operations with clearly defined output at the end as a characteristic variable of process management [3].

Process is a term that is used in various meanings. In the real world, there are several types of processes, such as chemical process, manufacturing process, biological process, technological process, or for example process as a run of application [4].

Process management is focused on the causes of arising discrepancies, not on the final outputs. This type of management control is based on the idea that the cause of company's bad results is inefficient running of company processes where it is necessary to make them rationale and more effective, which will result in higher added value for the customer [5].

The basis of the change is in the conversion from the state at the start to the state at the finish for the purpose of the improvement of the company position at the market. There must be constant care about the development of the company and its processes [6].

A continual improvement, also often called a continuous improvement process (abbreviated as CIP or CI), is an ongoing effort to improve products, services, or processes. These efforts can seek "incremental" improvement over time or "breakthrough" improvement all at once. Delivery (customer valued) processes are constantly evaluated and improved in the light of their efficiency, effectiveness and flexibility. Some see CIPs as a meta-process for most management systems (such as business process management, quality management, project management, and program management) [7]. W. Edwards Deming, a pioneer of the field, saw it as part of the 'system' whereby feedback from the process and customer were evaluated against organizational goals [8]. The fact that it can be called a management process does not mean that it needs to be executed by 'management'; but rather merely that it makes decisions about the implementation of the delivery process and the design of the delivery process itself. A broader definition is that of the Institute of Quality Assurance who defined "continuous improvement as a gradual never-ending change which is focused on increasing the effectiveness and/or efficiency of an organization to fulfil its policy and

objectives. It is not limited to quality initiatives. Improvement in business strategy, business results, customer, employee and supplier relationships can be subject to continual improvement [9]. Put simply, it means 'getting better all the time'.

The PivotTable is a method of organizing and analysing data by groups, categories, or classes that allows you to compare them. It connects the distribution of the variables of two variables and represents the extension of the simple frequency table [10]. According to theory, in tables 2x2, the expected number of cells for each cell found in the contingency table should be greater than 5. In the case of larger tables, however, compliance with this condition is often problematic, and consequently the inaccurate approximation of the chi-squared probability distribution by the probability distribution. However, according to some literature sources [11], for tables larger than 2x2, it is recommended to have at least 80% of the expected abnormalities greater than 5 or the expected abundance less than 1 in more than 10% of cases. The results of PivotTables analyses consist of selected statistical indicators such as Pearson's chi-square and the level of statistical significance "p". Pearson's Chi - Quadrate is the most common test of the relevance of the relationship between qualitative variables.

III. RESULTS AND DISCUSSION

The data were obtained through an on - line research questionnaire and a direct - led interview with managers of randomly selected businesses. The first database of enterprises was the data of the Statistical Office of the Slovak Republic, which was subsequently verified by Internet databases in order to select existing enterprises. The questionnaire was filled by 524 enterprises that have been researched, and despite the relatively low return of filled - in questionnaires stemming from unseen causes, we can say that a survey sample of 524 enterprises is relevant, has sufficient denunciation, which is also verified by selected mathematical and statistical methods (Table 1).

TABLE I. CHARACTERISTICS OF THE RESEARCH SAMPLE

The enterprise size	n	%
0-50 employees	376	71.75
51-250 employees	79	15.08
Over 250 employees	69	13.17
Subject of activity		
Manufacture	189	36.07
Business	114	21.76
Service	204	38.93
Distribution and transport	17	3.24
Business ownership		
Net domestic capital	371	70.80
Net foreign capital	28	5.34
Domestic capital predominates	86	16.42
Foreign capital predominates	39	7.44
The sector		
Wood - processing	82	15.65
Business	82	15.65
Other industry	42	8.02
Agriculture	14	2.67
Service	188	35.88
Building industry	74	14.12
Engineering, automotive and electrical engineering	42	8.02

Source: Authors

According to the calculation of the minimum statistical survey through the online application on www.raosoft.com, it is a representative sample at 99% confidence and 4% of the standard deviation. In next question we asked businesses if they regularly monitor and improve processes. The highest percentages received a response to the monitoring and improvement of manufacturing processes, with 50.38% for all enterprises. Purchasing and supply processes have reached 42.94%, logistics processes 30.34% and innovation processes 20.99%. Non-production processes, service and marketing processes, and CRM reached 17.18% in all monitored enterprises. The lowest percentages of responses were reported in 8.21% of all businesses, which do not regularly evaluate or even improve processes. The results are shown in Fig. 1.

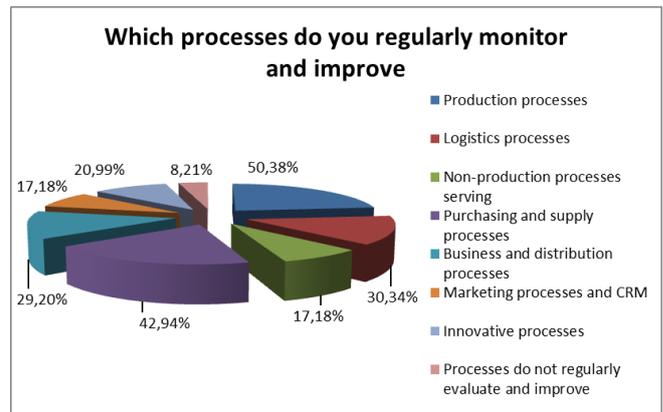


Fig. 1. Monitoring and improvement of processes in enterprises in the Slovak Republic (source: authors)

From the answers to the question of the use of concepts and methods in process improvement, the highest percentages received in the evaluation the answer that enterprises do not use any of the methods and concepts for process improvement. These percentages reached 60.69%. Kaizen (continuous improvement of business processes) and process controlling use 10.50% of enterprises. Higher values were recorded using benchmarking and TQM - Total Quality Management - 10.31%. The Balanced Scorecard (BSC) and the Six Sigma concept use the watched businesses ranging from 3.82% to 4.58%, while other concepts and methods are used at 0.19%. The results of the above questionnaire survey are shown in Fig. 2.

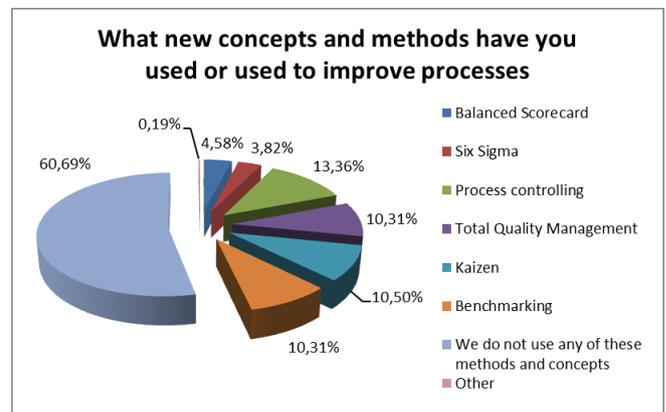


Fig. 2. New concepts and methods used to improve processes in enterprises in the Slovak Republic (source: authors)

Fig. 3 shows that most of the companies surveyed are improving quality by making changes, particularly in areas such as the higher quality of the services provided, identified by 55.73% of all enterprises. The second area of improvement was the lower number of complaints from customers, which was reflected in 36.26% of enterprises. The third identified area was higher product quality and technical parameters, where this improvement was recorded in 33.4% of enterprises.

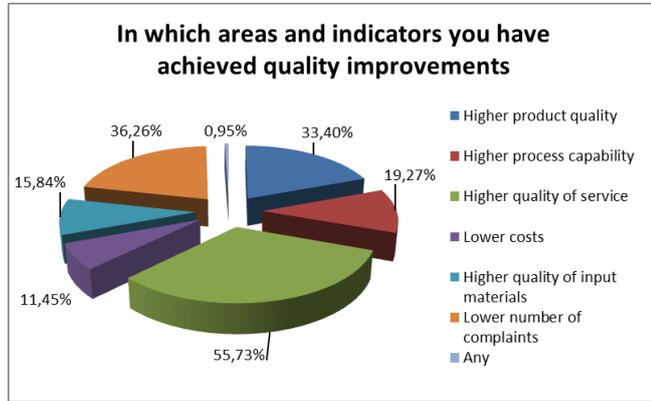


Fig. 3. Areas and indicators of the quality improvement achieved in enterprises in the Slovak Republic (source: authors)

TABLE II. CONTINGENCY QUESTION D-14

D. What is the Return of Equity (ROE) of your company reached in 2015?						
14. What new concepts and methods have you used or used to improve processes?						
Average number of responses per group	ROE value					
	< 0%	0% - 2%	2% - 4%	4% - 7%	7% - 10%	> 10%
All enterprises	1,41	1,06	1,08	1,14	1,26	1,16

Source: Authors

It can be seen from Table 2 that most of the process improvement methods were used by enterprises that had a positive value above 10% and a value of between 7% and 10%, which used on average only two methods of process improvement. On the other hand, companies benefiting at least from methods of process improvement have had a positive value of between 0% and 2%. On the contrary, for groups with lower returns ranging from 0% to 4%, the average number of answers is around 1. An interesting group is a group of enterprises with a negative ROE indicator. In this group, unlike previous analyses, we do not record the lowest value, but the third highest answer value. The observed result may be due to insufficient use of the methods, respectively their incorrect implementation. The results in Table 3 indicate that enterprises that do not use any of the methods and process improvement concepts really do not achieve any level of process optimization. Compared to the expected statistical frequencies, the percentage of enterprises responding to this combination was 53% of the enterprises. However, this assertion must be verified statistically using the p value, which is calculated using the chi-square test. The calculated p value for this table is $p = 0.000000426$, so it can be stated that the relationship between the level of process optimization and the use of new concepts and methods for improvement is

statistically significant. Based on the results, we can accept the hypothesis that the use of multiple concepts and methods to improve processes has a significant impact on the level of process optimization.

TABLE III. THE CONTINGENCIES OF QUESTION 6-14 FOR THE EXPECTED FREQUENCIES

6. At what level you optimize (improve) processes?									
14. What new concepts and methods have you used or used to improve processes?									
	$p = 0,05$ chi square test: 0.000000426								
The expected frequencies	Concepts and methods used to improve processes								
Level of process optimization	BS	SS	PC	TQM	K	B	N	Other	SUM
Optimization options are identified.	24,1	18,1	8,8	53,3	41,7	26,9	55,5	3,6	232
We have built a mathematical model to quantify total costs.	10,0	7,5	3,6	22,0	17,3	11,1	23,0	1,5	96
We have a modern technique for creating efficient business processes.	8,5	6,4	3,1	18,8	14,7	9,5	19,6	1,3	82
Business standards and processes are linked to identified business success factors and customer requirements.	58,5	43,8	21,3	129,0	101,0	65,1	134,4	8,8	562
We have created a change management program that ensures loyalty to employees.	25,2	18,9	9,2	55,6	43,5	28,0	57,9	3,8	242
None of these options apply.	13,7	10,3	5,0	30,3	23,7	15,3	31,6	2,1	132
SUM	140	105	51	309	242	156	322	21	1346
The expected value is lower than the actual value	The expected value is higher than the actual value								

In the table, shortcuts are used for titles of new concepts and methods: Balanced Scorecard (BS), Six Sigma (SS), Process controlling (PC), Total Quality Management (TQM), Kaizen (K), Benchmarking (B), We do not use any of these methods and concepts (N).

Table 4 analyses the relationship between the level of process optimization and return on equity (ROE). The purpose of this analysis is to determine whether the level of process optimization affects ROEs of the companies surveyed. As can be seen from the results of a comparison of expected and actual enterprise frequencies with a ROE of between 4% and 10% or more, these companies are at a better level of process management because the observed value of "Optimization options identified" is higher than expected. From this point of view, it can be assumed that these companies are in the process of removing bottlenecks at a higher level because they already have optimized processes or already know about processes that can be optimized. When considering the positive return on investment, Possibilities: Processes have already been optimized Enterprises with a return on investment of 0% to 2% have either identified optimization processes or are preferred by modern employee technologies at all levels Enterprises with ROE ranging from 4% to 7% and from 7% to 10%, compared to others at a higher level, as the results indicate that these businesses have seen frequencies higher than expected at 4 different levels of process optimization. The calculated p value for this table was $p = 0,0480$, so that this dependence can be determined as statistically significant. It can also be said that optimization tools and their use have a different but significant impact on the ROE value of the enterprise.

Using the process management, we can reduce the unwanted variability and associated non-productive costs, improve the production quality and thus the customer satisfaction leading to an increase in the profit as suggested in research studies of various authors [5], [12]–[15].

In this case, it is important to conclude that the business's performance depends also on other factors, not only those quality management practices analysed within this study. The significant impact on the business's

performance can be quantified depending on the experience and knowledge of the human capital, applying the strategic practices of decision-making support, the degree of technologization supported by the information technologies and production automation. The branch, its specifics and future trend in the research and development are also appreciable issues. Several studies [16]–[19] were published on this specific topic.

TABLE IV. THE CONTINGENCY QUESTION D-6 FOR THE EXPECTED FREQUENCIES

6. At what level you optimize (improve) processes? D. What is the Return of Equity (ROE) of your company reached in 2015?								
p = 0,05 chi square test: 0,0480								
The expected frequencies	ROE value						SUM	RF
Level of process optimization	< 0%	0% - 2%	2% - 4%	4% - 7%	7% - 10%	> 10%	SUM	RF
Optimization options are identified.	19,6	56,7	56,3	51,4	24,1	25,9	234	44,47%
We have built a mathematical model to quantify total costs.	2,5	7,3	7,2	6,6	3,1	3,3	30	5,73%
We have a modern technique for creating efficient business processes.	5,7	16,5	16,4	14,9	7	7,5	68	12,98%
Business standards and processes are linked to identified business success factors and customer requirements.	5,5	16	15,9	14,5	6,8	7,3	66	12,60%
We have created a change management program that ensures loyalty to employees.	3,6	10,4	10,3	9,4	4,4	4,8	43	8,21%
None of these options apply.	7	20,1	20	18,2	8,6	9,2	83	16,03%
SUM	44	127	126	115	54	58	524	
Relative frequencies (RF)	8%	24%	24%	22%	10%	11%		100%
The expected value is lower than the actual value			The expected value is higher than the actual value					

IV. CONCLUSION

Firms in Slovakia are currently exposed to strong competition on the one hand, but on the other hand, a number of new opportunities that, unless they lead to a significant increase in their performance, only give a small chance of shifting and achieving a successful business. Strong globalization pressures, starting with the lack of adequate workforce in organizations, cause competitive problems in business environments, and therefore improving quality through applying quality management principles, improving performance and process capabilities is considered one of the most effective ways to work in such a long-term environment, because the way of organizing processes and processes has an impact on the overall efficiency of the organization. As a result of a negative attitude to process management, it may be unnecessary to increase the costs and time to implement individual processes, or even reduce the quality of outputs, which ultimately leads to a dissatisfied customer. Therefore, it is important, in particular to maintain the competitiveness of an enterprise, to adapt the business process management system to ensure direct and day-to-day management, control, measurement and continuous improvement of processes at all levels of the enterprise. Based on the research results presented in this article, we see that businesses that are

responsibly involved in the process, tool, and quality management principle achieve better business results, better performance than businesses that do not use these activities.

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