

SUMMARY

In the paper entitled "**Management decisions in enterprises using a topological metric**" the argumentation of the repeatedly appearing idea in literature was presented (as mentioned in the content of the first two chapters of the paper) that the decision-making process is based on a series of well-thought-out activities including identifying and defining the essence of the decision-making situation. It was confirmed that defining alternative possibilities to solve the problem may result in choosing the best as well as the shortest path to success. It was justified that the idea of combining the known and previously considered methods supporting management with specific elements in this role, such as the topological metric, is possible and can give measurable effects in the decision-making process.

In chapter three the following hypothesis of the thesis was formed and presented, which was based on the information obtained during the subjective analysis of the literature and sample research results: **Management decisions in relation to two-dimensional areas of business activity is supported by the ring method which applies topological metrics.**

During the verification of the thesis main hypothesis, the auxiliary hypotheses were developed:

1. There are areas of the company's activity that can be described by two dependent variables.
2. Identification of the company's situation in a two-dimensional form determines the use of the topological metric.
3. The topological metric method allows you to make management decisions to reach the target with the shortest trajectory.

The same chapter also defines the main and specific objectives.

The main purpose of the doctoral dissertation was to obtain information based on survey data and to create the foundation to make the management decisions within Human Resources, processes stability and product competition.

In order to specify the main objective, the auxiliary objectives were formulated as follows:

- identification (based on the BOST survey) of the importance of factors describing the map coordinates: BCG personal matrix, process stability map, 3x3 matrix,
- determining the significance of differences in average ratings for individual factors,
- analysis of connections between subjective factors,
- creating an algorithm of conduct enabling management decisions to be made,

- demonstrating the usefulness of using topological metrics in management decisions.

The survey research was carried out using the innovative BOST survey, developed by the creator of the scientific area: "Toyotarism".

The study analyzes data (responses) relating to four areas included in the survey:

- area E12 defined as the respondent characteristics,
- area E1lc enabling the creation of a BCG personal matrix,
- area E1Og enabling the creation of process stability maps,
- area E4b enabling the creation of a 3x3 matrix.

The presented research presents conclusions which include comments on the implementation of research objectives and verification of the adopted research hypotheses.

The research method applied in the paper, unlike other available methods, allowed to obtain comprehensive information about the processes directly from employees who are mainly responsible for the proper course of processes and their outcomes. It was also indicated that the human factor, which is personal characteristics of the respondents and their commitment to self-development, has a huge impact on continuous improvement and competitiveness of the enterprise.

In the analysis of the results obtained in the surveys, not so much the levels of assessment of individual factors were taken into account but the variability of these assessments, which determined a dedicated measure being the coefficient of variation. Comparisons made in pairs and in various combinations allowed to extend the possibilities of inference. In addition, the division into zones resulting from the applied methodology allowed to indicate common features (the level of variability) for the factors analyzed in all the tools being used.

The paper repeatedly emphasizes that the applied instruments which present empirical data for the analysis of technological processes are presented in the form of maps. The individual points of these maps show the characteristic values of the results. They depend on their location, which confirms the accuracy of the title: the map. The distribution of research results on maps became the motive for applying a new ring method in the research, which assumes the use of a selected topological metric (in this study - the Euclidean metric). A family of rings was created in all instruments used to interpret the obtained results.

The considered feature in this part of the analysis was the share of individual survey results, previously marked on maps in the defined rings. An element of the statistical analysis was the coefficient of variation of the percentage share of the characterized feature.

The analysis of the connections between two factors presented in the paper (the two-dimensional approach in each of the applied tool) describing the production process allowed to prove that management decisions in relation to two-dimensional areas of the company's activity can be made one-dimensionally, using the topological metric. It was shown that the topological metric presented in the study as an instrument designed to analyze the locations of points marked on the maps of the aforementioned instruments, can be an innovative way of analyzing the production process. It was indicated that the work undertaken in this direction will make it possible to find a better solution to the problem in the examined company in the future. Thus, the hypotheses were verified and the appointed goal of the hypothesis was achieved.

The presented research results carry a grand potential of information on the functioning of enterprises and the ongoing processes. They can be an extremely helpful tool in the decision-making process as far as both, the company's current and planned activities are concerned.