**Summary**

**PREDICTION OF PRODUCTS QUALITY CONSIDERING
CUSTOMERS' REQUIREMENTS**

Maintaining high-quality products is a key issue for the survival and development of all organizations. Expected quality can be achieved by using different methods, but customer opinion is necessary during product improvement. Hence, to achieve customers' satisfaction, one should initially get to know their expectations, and then try to skilfully design or modify product. However, it is still problematic mainly in view of universal competition, turbulent environment, changes in customer expectations over time, but also the diversity and multitude of these expectations. Therefore, it is necessary to still search for possible modifications
of existing products, to adjust their quality not only to current but also to changing and future customers' expectations.

The problem discussed in the dissertation was the low possibility of methodical prediction of product quality as a result of hypothetical changes in its features and their importance. Therefore, the research purpose was to develop a model to predict the quality level as a result of changes in attributes proposed on the basis of information from customers.

The model was developed in ten main stages. As part of the model were developed, e.g.:
a procedure to obtain customers' expectations, a procedure to estimate the required number
of customers to predict products' quality, and an algorithm of determining combinations
of product criterion states (current and modified). In the model used e.g.: survey with Likert scale, Pareto-Lorenz (20/80) rule, alternative-point method (MAP), and Naïve Bayes Classifier. The realization of model stages was supported by using STATISTICA 13.3. program and MATLAB 2022a program. A test of the model was carried out based on the example of PROFI 1.2 household vacuum cleaner PROFI 1.2.

It was shown that the developed model allows determining the direction of product development along with the expected parameters of its features. This direction is determined by predicting product quality considering customers' expectations, which are obtained in the form of assessments that refer to the importance of features (attributes) and states of these attributes (current and modified). Simultaneously, it was confirmed that offering the product with respect to quality in line with the requirements of the market (customers) requires defining and including the importance of qualitative and quantitative attributes of the product, and also the company's production capacity.

**Keywords:** product quality prediction, customers' requirements, production engineering