

Mgr inż. Maciej Niemir

Improving the quality of the electronic product catalogue with the use of artificial intelligence

Summary

The doctoral dissertation, theoretical and empirical in nature, focuses on improving the quality of electronic product catalogs using artificial intelligence. The objective of the work was to develop and adapt a validation model for managing product data in electronic catalogs, integrating modern AI solutions. The research began with a literature review and exploration of standards and practices used in the e-commerce sector. As part of the exploration, guidelines for entering product data on e-commerce platforms were examined, and product databases from catalogs and online stores were analyzed. Based on the analysis of the largest database of unique products marked with Polish GTIN numbers, key challenges related to the validation of basic product data were identified. A multi-level validation model structure was developed, aimed at integrating traditional rule-based validation methods with AI-based techniques. A selection of forty-five validation algorithms was adapted, addressing the identified problems, and fitting within the developed structure, with particular attention paid to the potential use of AI in their development. The solutions were evaluated in real-world conditions, confirming their potential impact on improving data quality in product catalogs.

The developed product data validation model, along with the provided examples, represents a step toward the implementation of advanced technologies in business processes, in line with the principles of Quality 4.0. As a result, the solution supports innovation and competitiveness of enterprises in the digital age, enabling them to better adapt to the dynamically changing market demands.