ABSTRACT

The subject of this dissertation concerns the improvement of the methodology of technology development roadmaps through the incorporation of seven technology components into the methodology and its adaptation to the printing industry.

The undertaking of the present topic was prompted by two main considerations: (1) the lack of examples of methodical incorporation of the seven technology components into the methodology of technology development roadmaps; (2) the poor identification of the influence of the internal and external environment factors of enterprises that determine the development of the printing industry in Poland in the long term.

This reflection identified the following research gaps: (1) the lack of a methodology for technology development roadmaps taking into account the seven components of technology; (2) the lack of identification of the influence of the internal and external environment factors of enterprises on the development of the printing industry in Poland in the long term. The attempt to fill them was expressed in the research problems posed for solution in the dissertation: (1) How to improve the methodology of technology – roadmaps? (2) Which factors (social, technological, economic, ecological, political, values, legal) determine the future development of Poland's printing technology to the greatest extent? (3) Which factors in the environment of printing companies are characterised by the greatest uncertainty?

The research hypotheses subject to verification in the dissertation are the answers to the following questions: (1) The technology roadmaps methodology could be improved by incorporating the seven technology components into the construction of the technology roadmaps methodology; (2) Technological and value factors determine the development of the printing industry to the greatest extent; (3) Political factors characterise the greatest uncertainty in the printing industry.

Therefore, the main objective of the thesis was to improve the methodology of technology roadmaps by considering seven technology components such as physical equipment, software, communication and network resources, procedures, personnel resources, database, virtual space, and internal and external environment factors of enterprises, and adapt the methodology to the printing industry. The realisation of the main objective of the dissertation was linked to the achievement of specific objectives of a cognitive methodological and application nature, which include: (1) synthesis of the study work in the field of technology development roadmaps

methodology; (2) analysis of the conditions for the development of printing technologies in Poland; (3) development of scenarios for the development of printing technologies in Poland; (4) development of assumptions and methodology of technology development roadmaps taking into account seven technology components; (5) development of printing technology roadmaps in Poland in three time perspectives – 2023–2025, 2026–2030, after 2030.

The following qualitative and quantitative methods were used in the research process: critical literature review, desk research, STEEPVL analysis, in-depth interviews, expert panel, brainstorming, survey research based on the CATI technique, logical analysis and construction method, scenario method, statistical methods and technology roadmaps.

The studies and research conducted in the dissertation allowed to: (1) describing the current state of knowledge on technology management, technology roadmaps and technology roadmaps methodologies; (2) defining the aims and objectives of technology roadmaps methodologies taking into account the seven technology components; (3) developing the author's concept of technology roadmaps methodology taking into account the seven technology components; (4) identifying the key factors of polygraphic technology development in Poland; (5) operationalising the methodology; and (6) developing polygraphic technology roadmaps with reference to three time perspectives.

The summary of the results presented in the dissertation is the adaptation of the proposed technology development roadmap methodology to the printing industry.