Abstract

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Dissertation title: **Prospective projection of gerontechnology development in Poland**

The subject of this doctoral dissertation concerns the anticipation of the development of gerontechnology in a long-term perspective. The decision to undertake this research was motivated by the identification of the following research gaps: (i) limited recognition of the issues related to gerontechnology and the conditions of its development in both national and international academic literature; (ii) insufficient identification of stakeholders involved in the development of technologies supporting older adults; and (iii) the lack of a methodology aimed at designing the long-term development of gerontechnology.

The intention to address these research gaps is reflected in the formulation of the research problems, which focus on: (i) identifying the factors stimulating and hindering the development of gerontechnology in Poland; (ii) identifying stakeholder groups involved in the process of projecting its development; and (iii) developing a methodology for designing the long-term development of gerontechnology.

Based on a comprehensive literature review, the following research hypotheses were formulated, exemplifying the methodological framework of the research questions: H1: Technological, economic, and social factors are crucial in the context of the development of gerontechnology in Poland towards 2050; H2: The key stakeholders in the development of gerontechnology in Poland are older adults, their relatives, technology producers, and residential care homes; H3: The application of a hybrid of foresight methods (qualitative and quantitative) enables the anticipatory design of the long-term development of gerontechnology.

To verify the proposed hypotheses, a main research objective and six specific objectives were established. The primary objective of this dissertation was to develop a methodology for projecting the long-term development of gerontechnology. This was pursued through the achievement of the following specific objectives: (i) identification of key factors stimulating and hindering the development of gerontechnology in Poland; (ii) identification of key stakeholders in the development of gerontechnology in Poland; (iii) formulation of the research method selection framework to facilitate long-term projections; (iv) operationalisation of foresight methodology for the anticipation of gerontechnology development; (v) development of scenarios and a roadmap for the advancement of a selected gerontechnology in Poland; and (vi) formulation of recommendations regarding the use of the developed methodology and the development of gerontechnology in Poland.

The research process employed a variety of methods and techniques allowing for the acquisition and processing of knowledge in the fields of strategic management, foresight, and gerontechnology. Both qualitative and quantitative methods were applied, including literature review and critical analysis, document analysis, expert panels, survey research (CAWI), TEEPSE analysis, logical analysis and construction, as well as statistical methods. The proposed methodology for projecting the development of gerontechnology involved 14 foresight methods, both qualitative and quantitative in nature, including: megatrend analysis, literature review, TEEPSE analysis, technology mapping, patent analysis, stakeholder analysis, surveys, development scenarios, expert panels, brainstorming, development roadmap design, social impact assessment, in-depth interviews, and focus group interviews.

The studies and research conducted within this dissertation enabled: (i) the description of the current state of knowledge regarding gerontechnology; (ii) the identification of factors that stimulate and limit the development of gerontechnology in Poland up to the year 2050; (iii) the identification of stakeholders and the assessment of their level of influence and engagement in the development of gerontechnology in Poland in 2023 and in the 2050 perspective; (iv) the development of an original methodology for designing the development of gerontechnology using foresight methods and techniques; (v) the creation of a base canvas for a gerontechnology development roadmap; (vi) the implementation of a study to verify the proposed methodology for long-term projection of gerontechnology development, using the example of assistive robotics for older adults in Poland up to 2050; (vii) the development of scenarios for the development of assistive robotic technologies for older adults in Poland up to 2050; (viii) the creation of a roadmap for the development of assistive robotic technologies for older adults in Poland up to 2050; and (ix) the formulation of recommendations for the application of the longterm projection methodology and the development of gerontechnology in Poland.

The survey research, aimed at identifying stakeholders and factors influencing the development of gerontechnology in Poland, was conducted using the CAWI technique. The study involved 602 Polish residents representing older adults (aged 65 and over) or those involved in the care of older individuals, or in the development of gerontechnology. The verification of the original methodology proposed in this dissertation was conducted with the involvement of two research teams: the team conducting the research process and an expert panel composed of individuals associated with the analysed technology. The expert team consisted of 23 members representing various sectors and disciplines, differing in age, educational background, and type of association with the field of gerontechnology. The team included senior citizens, relatives of older persons, technology producers, representatives of

hospices and healthcare institutions, as well as representatives of business, public administration, and academia.

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