

Doctoral dissertation abstract

„Developing a knowledge management methodology for interdisciplinary R&D projects“

In the era of the knowledge-based economy, the development of industries within the scope of National Smart Specialisations is crucial, ensuring the creation of innovative socio-economic solutions that increase the added value of the economy and improve its international competitiveness. This is reflected both in research and development (R&D) activities which aim to enhance knowledge resources and create new applications for existing knowledge, as well as in the support for their execution by public funding, e.g. through co-financing granted by the National Centre for Research and Development (NCBR).

The existing deficits and the demand of entities conducting R&D operations, regarding the methods of comprehensive and coherent knowledge processing, became the stimulus for addressing the presented subject. Problems related to knowledge management in R&D projects have a significant impact on efficiency and the achievement of goals of such projects, which are crucial for the development of innovation.

The main objective of the research was to identify, characterise and structure knowledge management processes in research and development operations, enabling to develop the Methodology for knowledge management in R&D projects, particularly those of interdisciplinary nature. It has important implications from the scientific perspective, from the perspective of the entities conducting R&D projects and from the economic perspective as well. The identified problem and the proposed approach to solve it were positively evaluated by the Ministry of Science and Higher Education within the „Implementation Doctorate“ programme.

The state of knowledge in the subject matter was identified based on the literature review. Existing knowledge in the field of management and quality was not sufficient to solve the identified problems – number of research gaps (theoretical, empirical and practical) were identified, which were necessary to fill, both in the context of the development of scientific knowledge and its practical application in business activities related to the execution of research and development projects. On this basis, the following research questions were formulated:

- Q1. What are deficits of stakeholders related to knowledge management in R&D projects?
- Q2. What knowledge management processes occur in R&D projects?
- Q3. What are the characteristics of the identified knowledge management processes?
- Q4. How should the identified knowledge management processes be structured?
- Q5. What would be the adequate form of implementation of the developed Methodology in R&D activities?
- Q6. Does the developed Methodology meet the requirements of stakeholders?

Empirical research in order to answer the stated research questions, fill the identified gaps and achieve the objectives was carried out in the environment of entities conducting R&D projects co-financed by the NCBR. The initial stage of the research included participatory observations and unstructured interviews, which were completed within the author's involvement in such projects. It provided the basis for the development of the first versions of tools used in further stages of the research. This was followed by the first (confirming the chosen direction of the works) questionnaire study, structured individual interviews (enabling a deeper understanding of the analysed issues) and the second (validation) questionnaire study.

The structure of the dissertation reflects the sequence and logic of the conducted works. The first chapter discusses the existing state of knowledge in the areas of R&D operations and project management, additionally presenting the context of interdisciplinary projects. The second chapter discusses the existing state of knowledge in the area of knowledge management, focusing on the process model and the context of R&D projects. The third chapter explicitly defines the research gaps in the field of knowledge management in R&D projects (that had been identified based on the literature review discussed in the first and second chapters), formulates the main objective of the research, the detailed objectives and the research questions, as well as presents the design of the research process. The fourth chapter presents the proceedings and results of the conducted empirical research. The outcomes of the works were positively validated (in terms of the ISO 9001 standard), indicating the effectiveness of the activities carried out. The conclusion of the dissertation includes a summary of the answers to the research questions, the level of stated objectives achievement, the limitations of the conducted research, as well as recommendations and plans for further works in the subject field.

The developed Methodology for knowledge management in R&D projects can be implemented in R&D activity (it has been confirmed that the requirements for its intended use had been met), while it is reasonable to further develop the Methodology into an IT technology – which is directly in line with the thematic scope of grant competitions organized by the NCBR, indicating a possible direction for the exploitation of results and continuation of the works conducted within the framework of the doctoral dissertation.

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