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Tytuł: „*Modelling the process of technical knowledge externalization for the research and development department*”
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Summary

Production enterprises in a knowledge-based economy undertake new tasks, often as a research and development nature, in order to build innovative solutions. It is necessary for it to be carried out by research and development (R&D) department whose work is largely based on technical knowledge, which is difficult to obtain and transfer. Its fundamental source are employees. The problem is the lack of methods and tools supporting the management of technical knowledge (tacit) along with its quantitative measurement.

The aim of this dissertation is to model the process of technical knowledge externalization using the Bayesian network. The model assumes two stages of externalization: (1) occurring in the mind of the R&D engineer in acquiring technical and explicit knowledge, and (2) occurring during the working of the Bayesian network. In this way, new knowledge is generated and obtained by the company's management.

In this work, a method of externalizing technical knowledge for the R&D department was developed, including the following elements:

- Reference model of the R&D department and processes carried out in this department.
- A questionnaire of knowledge used to acquire technical knowledge.
- Bayesian network, whose cyclical learning (eg. quarterly) is based on the knowledge base.
- Assessment and interpretation of the knowledge level.
- Acquiring and applying new knowledge.
- Archiving knowledge.

The research method was verified on the basis of a case study companies from the automotive industry whose main product is the components of a pneumatic system. Detailed analysis was carried out for the "valve" type of product.

As part of the work, a web application was designed and implemented to support the process of technical knowledge externalization in the research and development department, called KnowledgeNets. Implementation of the solution will enable effective work in the R&D department and will allow to achieve defined benefits for the company, i.e. reduction of project realization time, reduction of used project budget and reduction of the internal trainings duration time for new employees.