

# JOINT PROJECT IMPAKT AIMS TO MAKE IMPACT ANALYSIS EASIER

By Martin Holland

January saw the launch of the joint project „ICT-enabled model-based impact analysis in product development“, or ImPaKT for short, which is being funded with the support of the German Federal Ministry of Education and Research (BMBF). Within the framework of the project, PROSTEP will be extending its OpenPDM family to include a software module for the cross-domain coordination of changes and validating the functionality of the solution together with industry partners.

# ImPaKT



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The more complex and variant-rich products become, the more time-consuming it is for companies to reliably analyze and evaluate the technical and financial impact of changes. The challenges grow when a large number of partners and domains are involved in the product development process. Impact analyses are designed to help companies identify the possible impact of product changes in advance.

A consortium of research institutes, software vendors and user companies, under the leadership of the Heinz Nixdorf Institute at the University of Paderborn, is developing a model and IT-based approach with the aim of making this type of analysis in product development easier. The joint project, which was launched in January, will run for three years and has a project volume of approximately four million euros.

The number of product variants is constantly growing. Every modified detail means changes in the design and production processes of all the partners involved. When it comes to developing complex products, incomplete and distributed data and knowledge bases, media discontinuities in the information flows, a lack of supplier integration and the large number of variants make engineering change management (ECM) a time-consuming and error-prone process. In the joint ImPaKT project, the consortium partners intend to develop a solution that makes it possible to efficiently analyze the impact of changes on the basis of a comprehensive data and knowledge base, while at the same time making the complexity of variant management more manageable using function-oriented impact analyses.

The integration of mechanical, electronic and software components in a single product requires an interdisciplinary development process. A key objective of the project is the development of a reference architecture for end-to-end model-based system development that links the partial models in the existing data repositories created during the development of mechanical, electrical and software system components and creates a common parameter space for changes. The project partners will develop and implement methods for a fully integrated impact analysis using model-based systems engineering (MBSE) and artificial intelligence (AI) algorithms on the basis of this integration platform. Standards for integrating impact analysis in process management and cross-enterprise collaboration are also to be defined.

In addition to the HNI, the Institute for Machine Elements and Systems Engineering at RWTH University in Aachen, the software companies CONTACT Software, Itemis and PROSTEP, as well as the user companies Eisengießerei Baumgarte, Hadi-Plast Kunststoff-Verarbeitung, Hofmann Mess- und Auswuchttechnik, CLAAS Industrietechnik, Knapheide Hydraulik-Systeme and Schaeffler are involved in ImPaKT.

The software partners will be implementing a demonstrator based on the ImPaKT reference architecture. The industry partners' primary task will be to validate the suitability of the project results for supporting impact analysis on the basis of three case studies.

PROSTEP is contributing its many years of expertise with system modeling and the development of reference architectures to the consortium project. Building on this architecture, we will be developing certain basic services for performing cross-system impact analyses using artificial intelligence (AI). We will be using



our integration platform OpenPDM, which is implemented at by over 200 customers worldwide, as the basis for implementing the demonstrator. OpenPDM is the world's leading solution for synchronizing and migrating PLM data and processes in a wide variety of application scenarios and domains.

We intend to expand the software to include essential ALM and ECM aspects within the framework of ImPaKT. Once the project has come to an end, it is intended that the solution, which is designed as a demonstrator, be turned into a commercial product and marketed under the name OpenCLM. Maintenance of the solution is a prerequisite for long-term commercial use of the project results and provides a benefit outside the circle of consortium partners.

By participating in the consortium project, we not only expect to be able to establish interesting contacts with customers and universities and expand our AI expertise. We also hope it will provide important impetus for the further development of our OpenCLM solution in the direction of cross-system and cross-domain impact analysis. This is a prerequisite for being able to coordinate changes to complex products with an acceptable level of effort.



**Martin Holland**

+49 6151 9287-0  
martin.holland@prostep.com