



# AI-supported migration

Efficiency improvements with machine learning and large language models

The modernisation of legacy systems is one of the most urgent challenges insurers will have to overcome if they hope to take advantage of the opportunities of digitisation and to reduce costs. As part of an IT modernisation project, large data sets and extensive knowledge have to be migrated from source systems into the target system – not to mention the reimplementing of actuarial functionality to administrate the contracts in the target system. Transferring these features – under the conditions of the target system – is an exceptionally complex and costly part of the migration process, which is often done manually by actuaries in the conventional approach and ties up valuable resources.

## Partial automation of migration

For a number of years, msg insur:it has been working on solutions for the automated transfer of actuarial functions. As part of an ongoing, publicly funded research project in cooperation with the Ludwig Maximilian University of Munich and the Munich Centre for Machine Learning, msg insur:it is developing methods of partially automating migration projects that have already been put into practice successfully and are being refined continuously. The methods are a hybrid mix of deep neural networks, symbolic regression and neural trees supplemented by large language models (LLMs). For the sake of the explainability required by supervisory regulations as well as the future expandability and adaptability of the methods, white-box models are used wherever possible.

## The use of AI in the operational computing core places high demands

The accurate mapping of mathematical functions for operational use in a computing core places high demands on the AI methods being used in terms of quality, reliability and efficiency. msg insur:it possesses the vast sector-specific know-how, comprehensive AI expertise and years of migration experience needed to implement AI-based migration methods successfully. Portfolio migrations offer good framework conditions for the use of AI-based methods. Contracts (data) and knowledge (functions) which define the behaviour

of the contracts in the future are transferred from an (old) source system to a (modern) target system. A laborious analysis of the knowledge incorporated in the old system becomes unnecessary and can be replaced by machine learning.

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The target image of an AI-supported migration involves a multi-stage procedure:

1. Machine learning from the data, documents and source code of the source, as well as the digital mapping of the knowledge in a knowledge hub
2. Quality control in the form of extensive testing for the knowledge generated from the source
3. With consideration for the technology of the target system, the knowledge hub generates technical artifacts that can be deployed into the target system (msg.Life Factory) directly

In order to analyse formulae, contract and portfolio data, a variety of different machine learning and statistical methods are used to extract the knowledge from the source systems.

At the same time, documents such as business plans, notifications required by the German Act on the Supervision of Insurance Undertakings (also known as ‘13d notifications’) and source code are automatically analysed and evaluated on the basis of LLMs (Transformer). Likewise, the knowledge generated from this is compiled in the knowledge hub in a standardised format. This provides simple, permanent access to the entirety of the knowledge in the source – access that can be controlled with permissions. This method also makes it possible to compare the current and target statuses of the source and detect potential non-conformities even before migration to the target system, which is to say the use of AI-supported methods not only makes migrations faster and more efficient, but also improves their quality.