Fraunhofer IPK

Fraunhofer Institute for Production Systems and Design Technology IPK

Case Study: T-Systems

Planning a Digital Railroad Signaling Infrastructure With MBSE Methods and Tools

As a subsidiary of T-Systems International, T-Systems Schweiz is shaping the interconnected future of business and society with innovative ICT solutions. The globally distributed »Global Delivery Network«, with both nearshore and offshore development centers, enables customers to optimize project management in terms of costs, expertise and capacities.

The challenge

A prominent Swiss railroad company aimed to develop an architecture for a »Digital Signaling Control System« and its surrounding components. This required an overview of the necessary systems for core and support functionalities and their dependencies. The objective was the analysis of the required functionalities – not yet on the technical implementation.

Model-Based Systems Engineering (MBSE) had to be used to develop the architecture. The result was meant to ensure that all development steps were traceable, from the created system elements back to the interviewee who made the request.

T··Systems· Let's power higher performance

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With its methodological expertise in modeling and linking requirements and functions, Fraunhofer IPK is a reliable and proven partner. Due to highly effective collaboration, the task was completed successfully within a month.«

Johannes Gerner
Head of Public Transport T-Systems Schweiz

Joint work

In collaboration with Fraunhofer IPK, functional and non-functional requirements were identified from stakeholder interviews and documented accordingly, so that the necessary functionalities of the system could be derived.

They were then modeled in the »Enterprise Architect« software and comprehensibly linked through an MBSE model. The functionalities and the systems required for implementation were mapped and dependencies modeled in order to derive an architecture and validate it with the client.

The solution

The findings from the interviews were used by the client to validate and optimize the planned solution building blocks, such as an information management system, in line with stakeholder expectations.

The created model allows the solution building blocks to be traced back to their original requirements based on the interviews. It can therefore also be used to evaluate alternative solutions and to plan the implementation of building blocks that were previously solution-neutral, for example by selecting specific data bases, IT systems or communication systems.

The MBSE approaches and tools can also be utilized to describe technology on interview-based requirements, while maintaining the advantages of comprehensive traceability.

Further information:
www.ipk.fraunhofer.de/digital-engineering-en
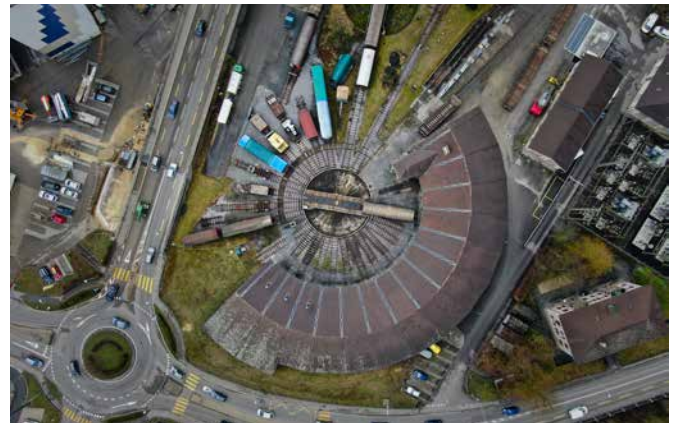
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About Fraunhofer IPK
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With the help of application-oriented research, we develop solutions along the entire industrial value circle.

Our guiding idea is a digitally integrated production in which man and machine interact on the basis of data and can thus adapt flexibly and proactively to changing requirements.