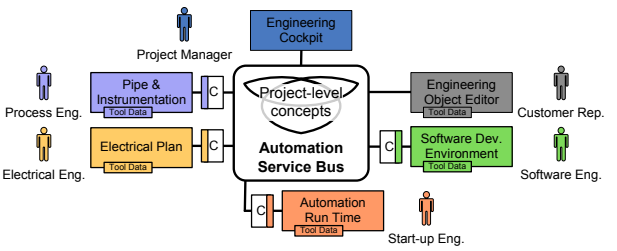
Automated Generation of Defect Detection and Defect Handling Code



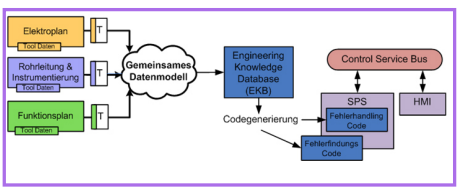
A majority of control application codes focuses on safe responses on plant misbehavior (e.g., based on a sticking valve) rather than on controlling the functional behavior of the plant. Software components typically hide controlling tasks and have to be adjusted manually according to individual facility requirements. Common concepts enable the generation of SPS-code with respect to identifying and handling defects based on an automation-supported facility analysis.

Goal

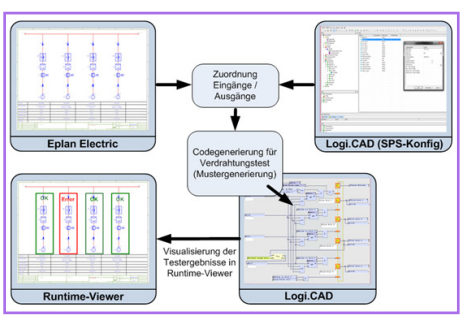
Appropriate methods for defect handling are important parts of automation systems to ensure a safe operation of systems and components. Thus, the implementation of control and defect handling procedures are typically tightly coupled and might lead to intertwined and complex software code. Because of code complexity software maintenance and extensibility become even more difficult. In addition defect detection during runtime is challenging and can be supported by automation supported defect detection approaches. Nevertheless, knowledge required for defect detection and handling is embodied within engineering objects of individual disciplines (e.g., P&ID, function plans, and electrical plans) and their related engineering models. The main goal is using this knowledge for automation supported defect identification and handling.

- Reduction of implementation effort for generating SPS Error-Codes.
- Significant improvement of defect handling code structure and improvement of reusability of defect handling codes based on design pattern.
- Increased readability of generated code.

Code generation and defect detection during runtime



Automation-supported wiring test



Customer Benefit

- Effort reduction for implementing defect handling code.
- Efficient discovery of defect root causes and reduction of machine downtime.
- Simplification of commissioning due to automated wiring tests and loop inspection.
- Efficient and reliable defect recognition during runtime.

Solutions

logi.cals and the Christian Doppler Laboratory at TU Wien provide the “Automation Service Bus®”, an open source platform, to bridge the technical and semantic gap between heterogeneous tools and data models. The Integration and combination of planning data from heterogeneous disciplines (e.g., P&IDs, circuit plans, function plans, and control application code) enable automation-supported facility analyses and, based on the analysis results, an automation supported generation of defect identification and defect handling procedures. Aligning circuit plans and SPS configuration enable the generation of wiring tests. Combining engineering data from various sources can enable the identification of closely related functional behavior of signals (across disciplines) and an automation-supported generation of effective and efficient facility defect identification and handling procedures.

Technical Data:

- Automation Service Bus®
- Semantic Integration of planning data on project level
- Engineering Knowledge base
- Automated generation of defect handling codes

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