



# **CODESYS®**

## **Publically funded research projects**

### **CODESYS Feature Briefing, March 2022**

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## On-the-Fly Data Flow Analysis (Project „Jicolyzer“)

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## TSN (Project „KITOS“)

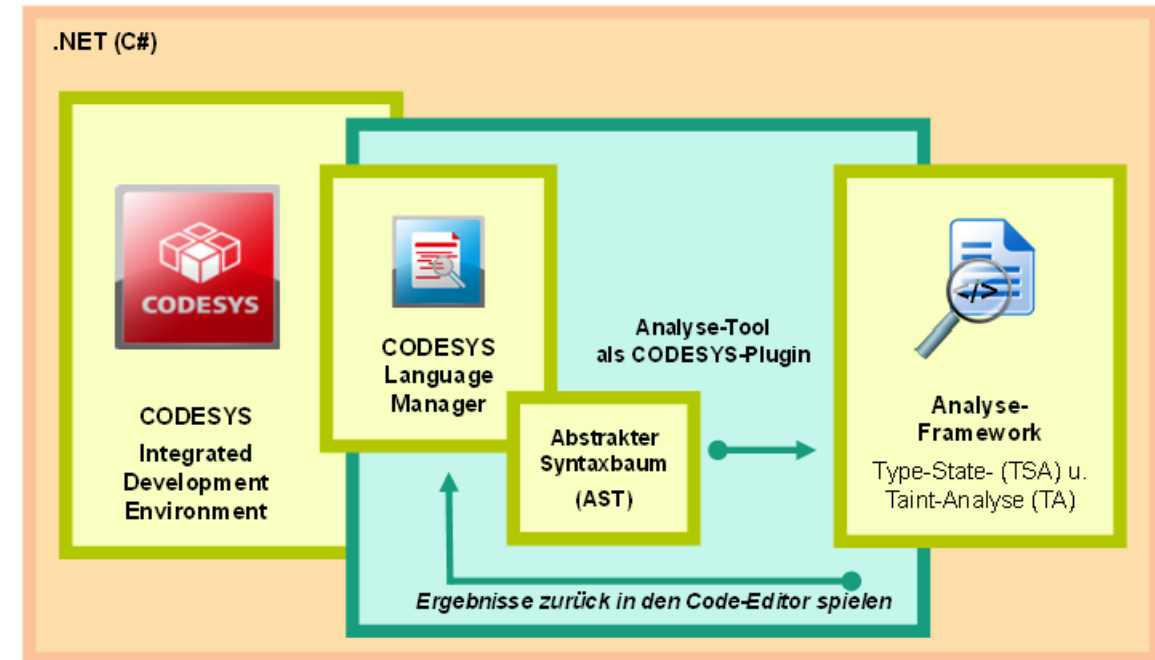
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## Software Defined Manufacturing (Project „SDM4FZI“)

- Virtual controllers on servers
- Cloud-based engineering and testing
- Virtual commissioning: interface to digital twins

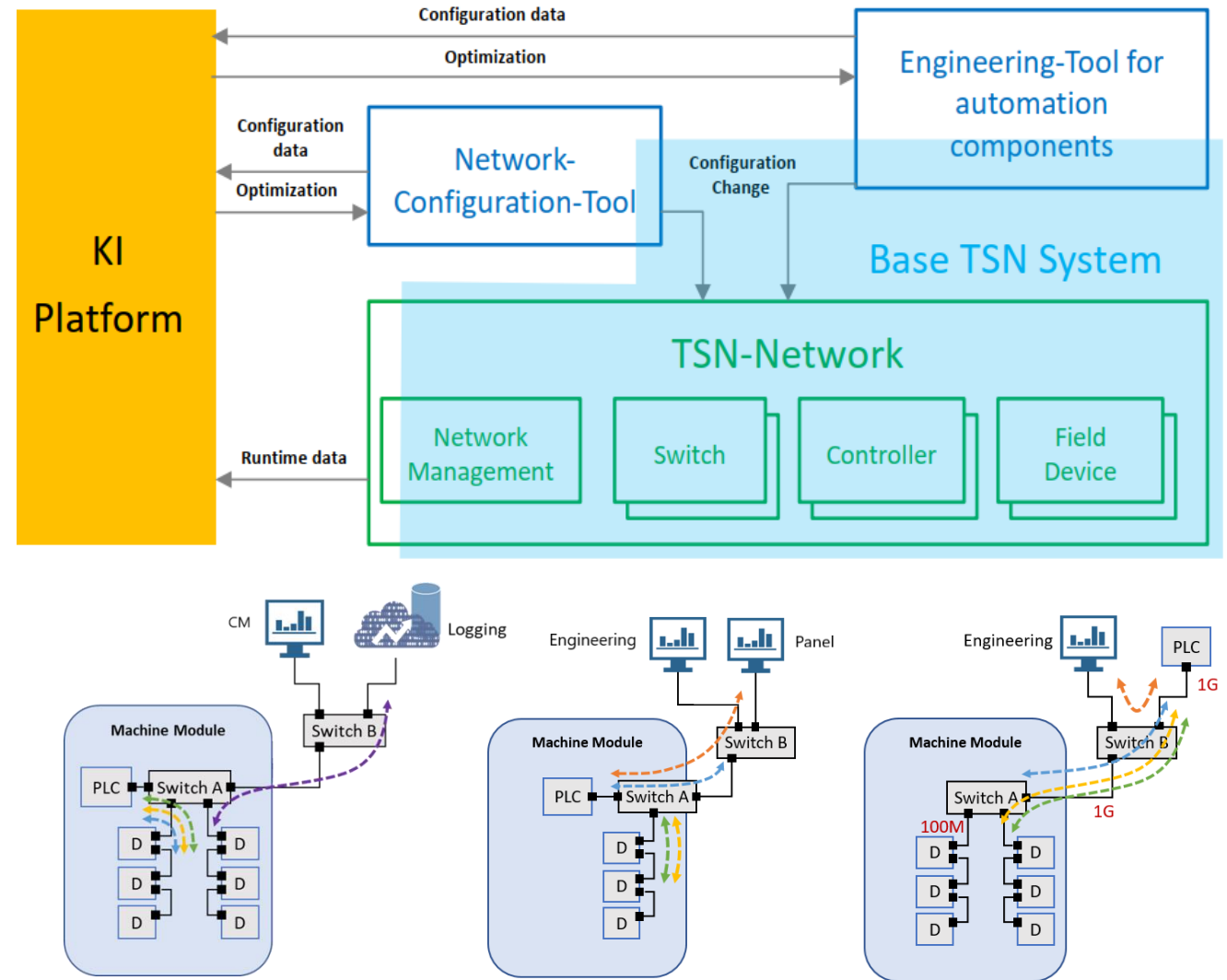
## Jicolzyer: On-the-Fly Data Flow Analysis

- **Error detection in the editor with on-the-fly data flow analysis**
  - Insecure flow of passwords, untrusted values ... (*taint analysis*)
  - Invalid settings before a method calls (*type-state analysis*)
- **Fraunhofer Institute + CODESYS**
- **Our contribution**
  - Interface analysis framework with our internal language model
  - Taint & type-state annotations for library functions
  - Display errors & apply quick fixes
- **Project end: 2023**



## KITOS: Artificial Intelligence + Time Sensitive Networks (TSN)

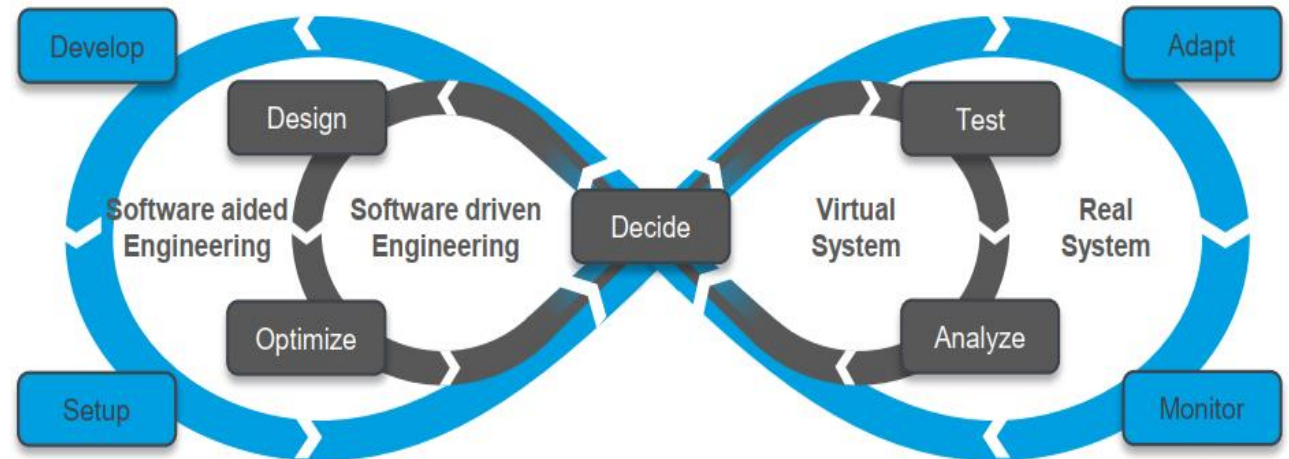
- **TSN system** with CODESYS and Bosch controllers and Hilscher netX devices
- **+ AI** uses configuration data and network monitoring for optimization
- **3 institutes + 3 companies**
- **Use cases of TSN in automation**
  1. Direct CM/logger access to field devices
  2. PLC with 1 ethernet adapter (RT + non-RT)
  3. Multiple Edge PLCs using the same network
- **Our contribution**
  - OPC UA Pub/Sub over TSN
  - EtherCAT and Profinet over TSN
  - Time-triggered sending with i225
- **Project end: 2023**

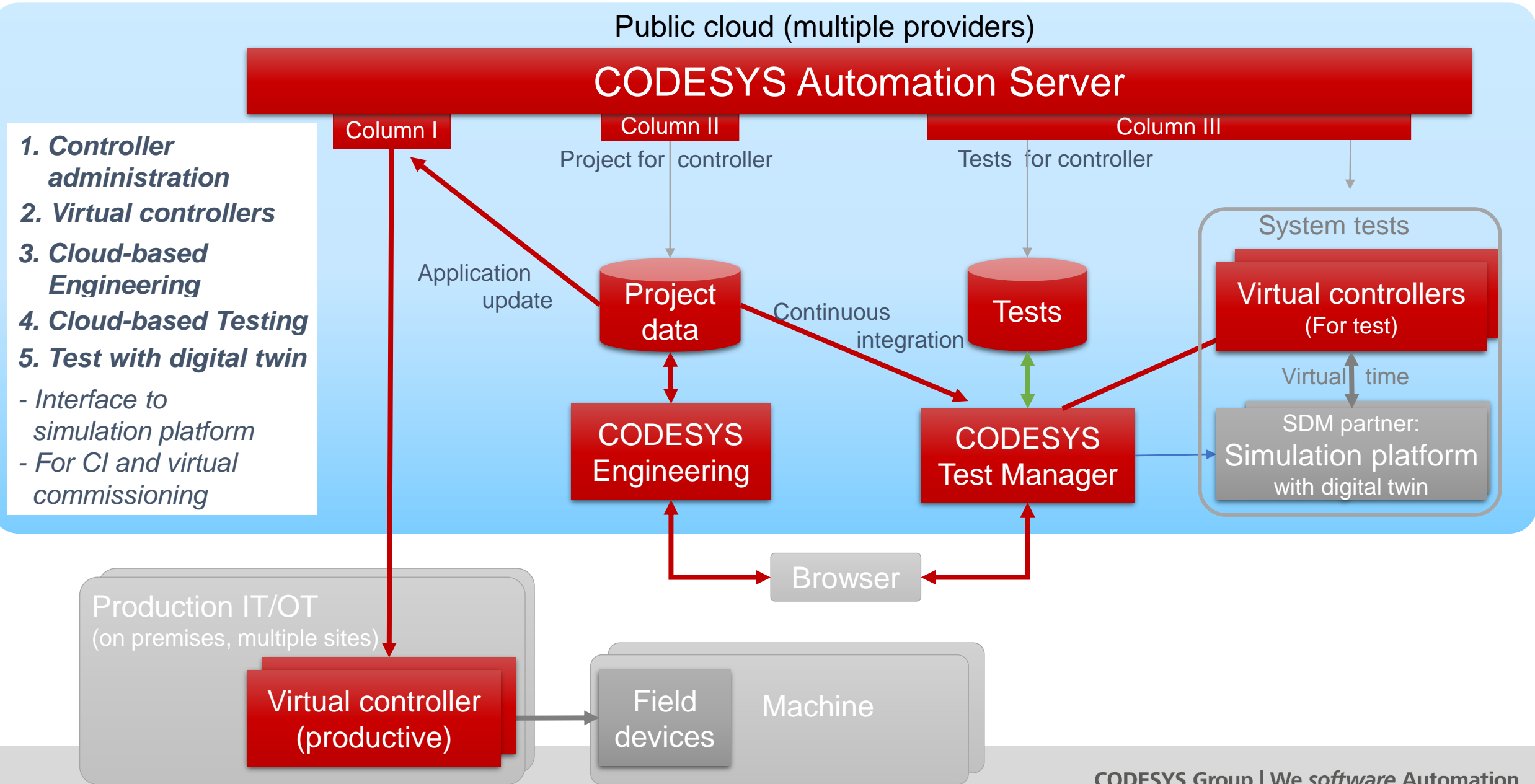


## SDM4FZI: Software Defined Manufacturing for the Automotive Industry

- **Big project with 2 institutes + 22 companies**
- **Support agile small changes of the automated production (continuous development)**
- **→ production flexible by definition in software**
  - End-to-end engineering process from digital planning of the production
  - ... over automatically generated machine simulation (digital twin)
  - ... and automated testing & virtual commissioning (virtual production)
  - ... to virtual controllers in an edge cloud (deployment, orchestration)
- **Our contribution**

Several new functions connected by CODESYS Automation Server ...
- **Project end: 2024**





1. **Controller administration**
  2. **Virtual controllers**
  3. **Cloud-based Engineering**
  4. **Cloud-based Testing**
  5. **Test with digital twin**
- Interface to simulation platform
  - For CI and virtual commissioning



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