OTX – Open Test Sequence eXchange

Efficient Design and Real-Time Testing of Diagnostic Sequences

Dr. Jörg Supke, Tobias Widmer

emotive
Automotive Software Solutions

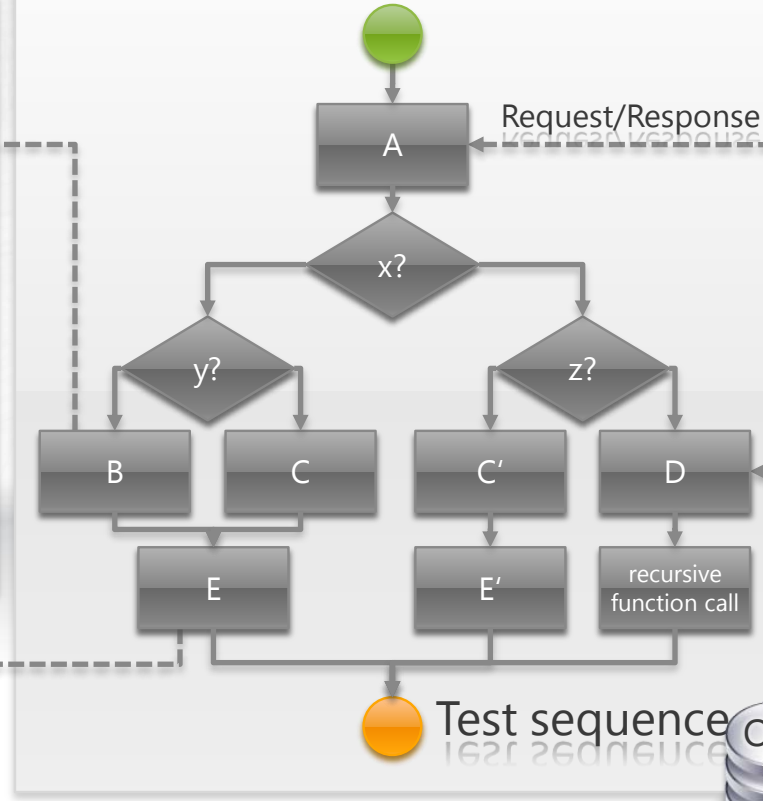
OTX – Open Diagnostic Data eXchange

- Standardized in the ISO 13209
- Platform and tester independent exchange format for the formal description of test sequences
- Application areas:
  - Vehicle diagnostics e.g. commissioning sequences or guided troubleshooting
  - Test automation
  - HIL simulation
  - …
- Initial application: Exchange format for ODX based diagnostic sequences
  - Diagnostic sequences describe the different interactions between the applicant (development, production or service), the diagnostic tester, the ECUs and the external measurement system

Diagnostic Sequences Between User and Vehicle Interaction

GUI

ShowScreen



Off-Board communication

ECUs

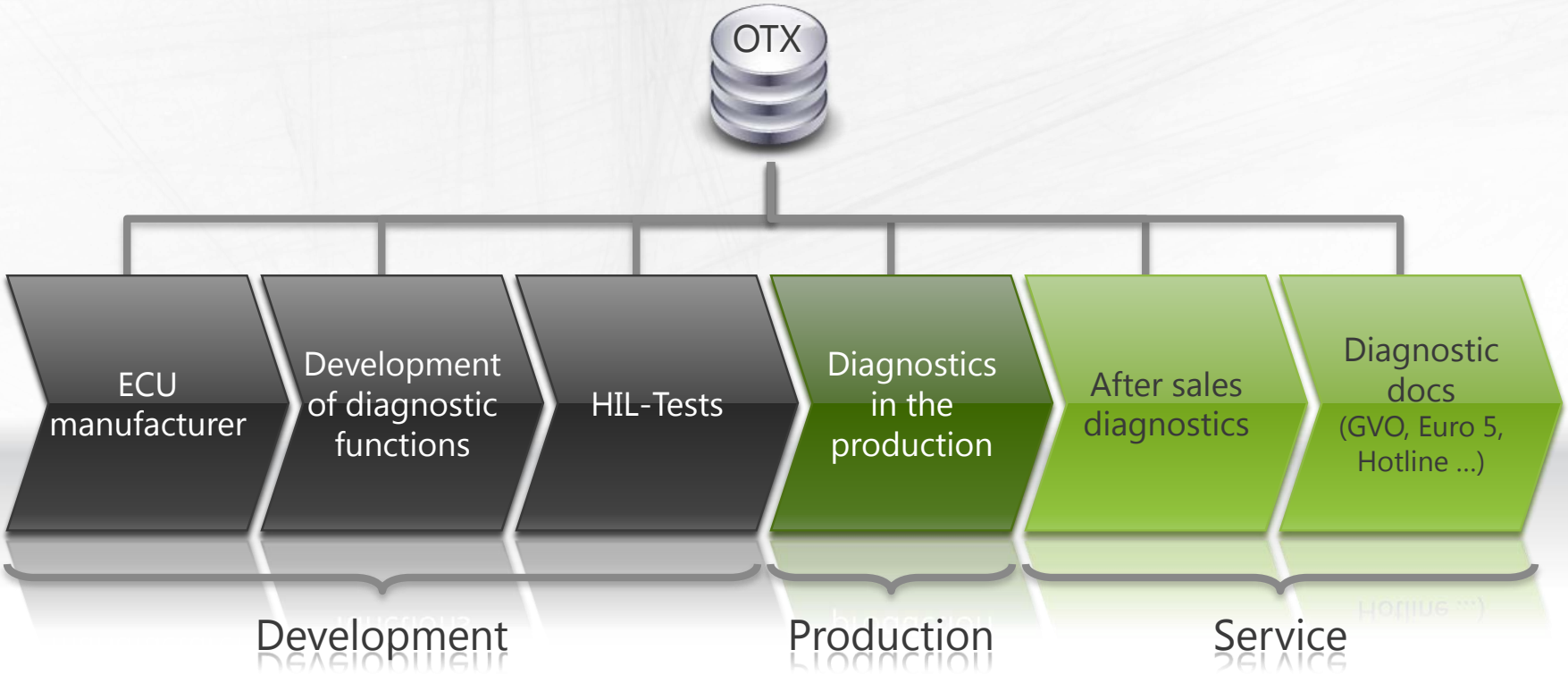
External sensors & actors

Diagnostic tester
in development, production and service

Data Model Properties

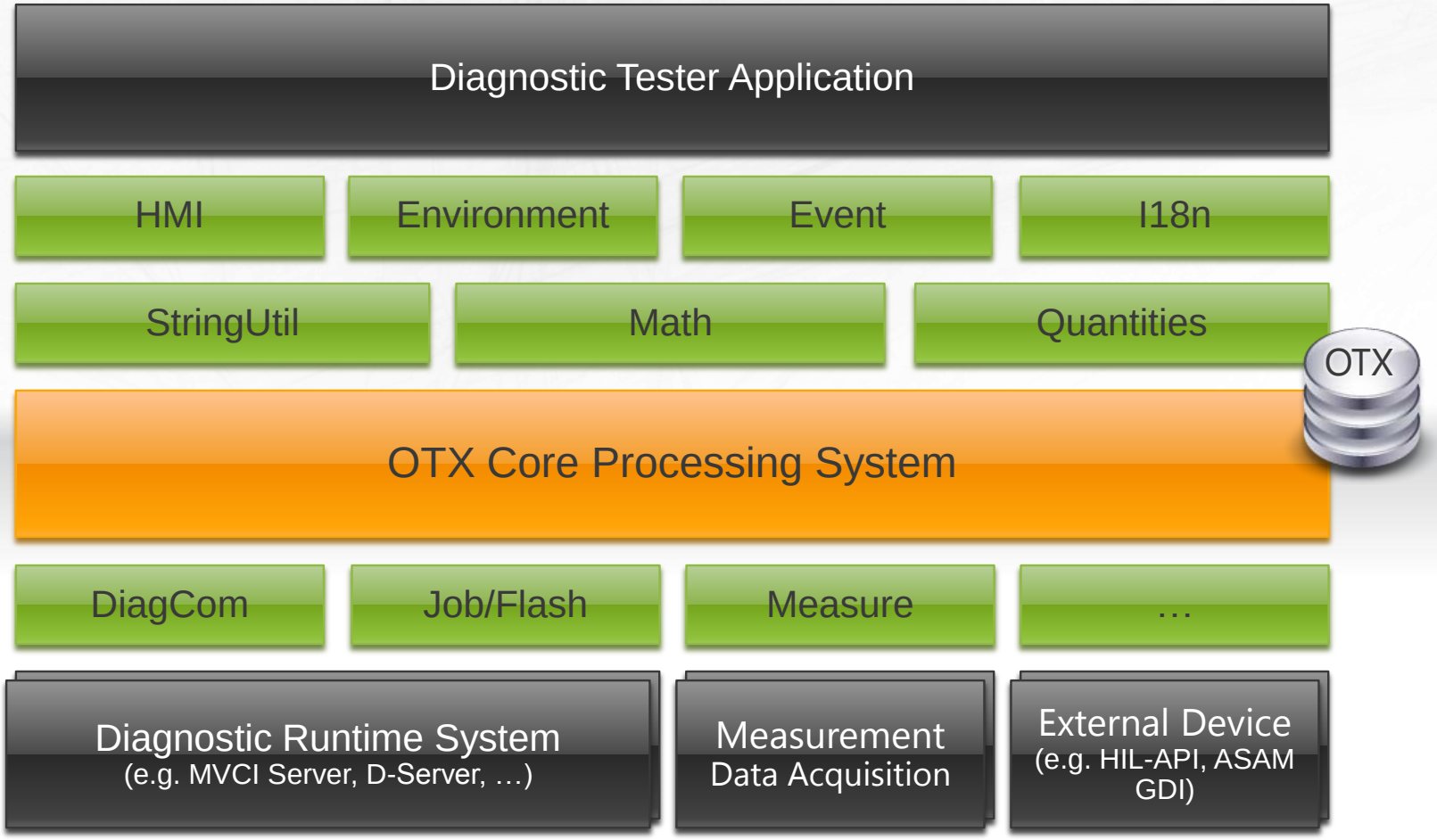
- Structured programming
- Declaring of sequences, variables, constants and meta data
- Reading and writing of environment data
- Specification field in nodes and free comments
- Extension points for connecting new functions
- Control structures
- Loops (while, do-while, for, for-each)
- Branches (if-then-else)
- Parallel sequences
- Calls (sequences, calculations etc.)
- Error and exception management

Application in the Diagnostic Process Chain

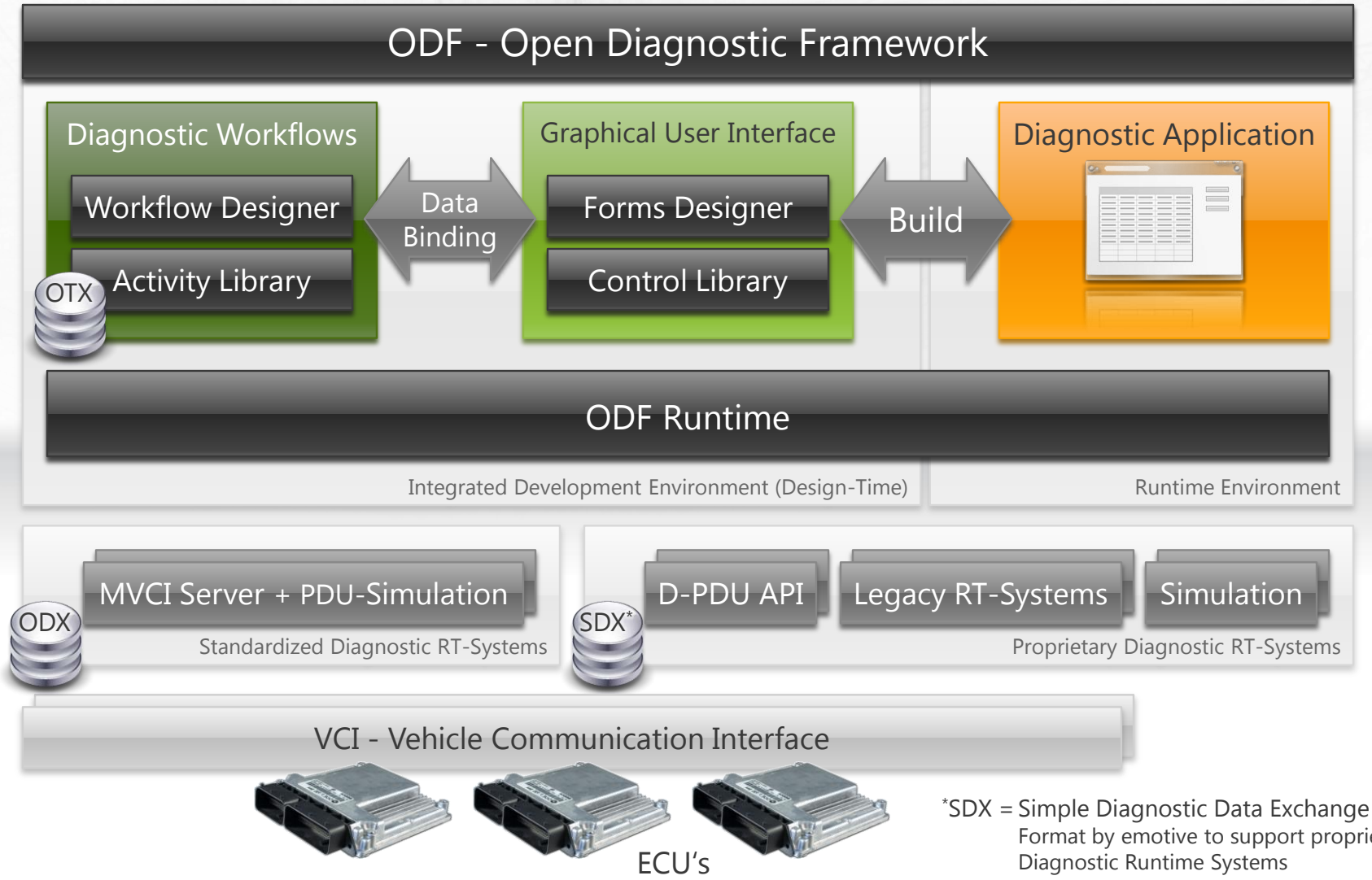


Goal: Exchange and archiving of verified and tested diagnostic sequences

Interfaces & Extensions



Principal Architecture

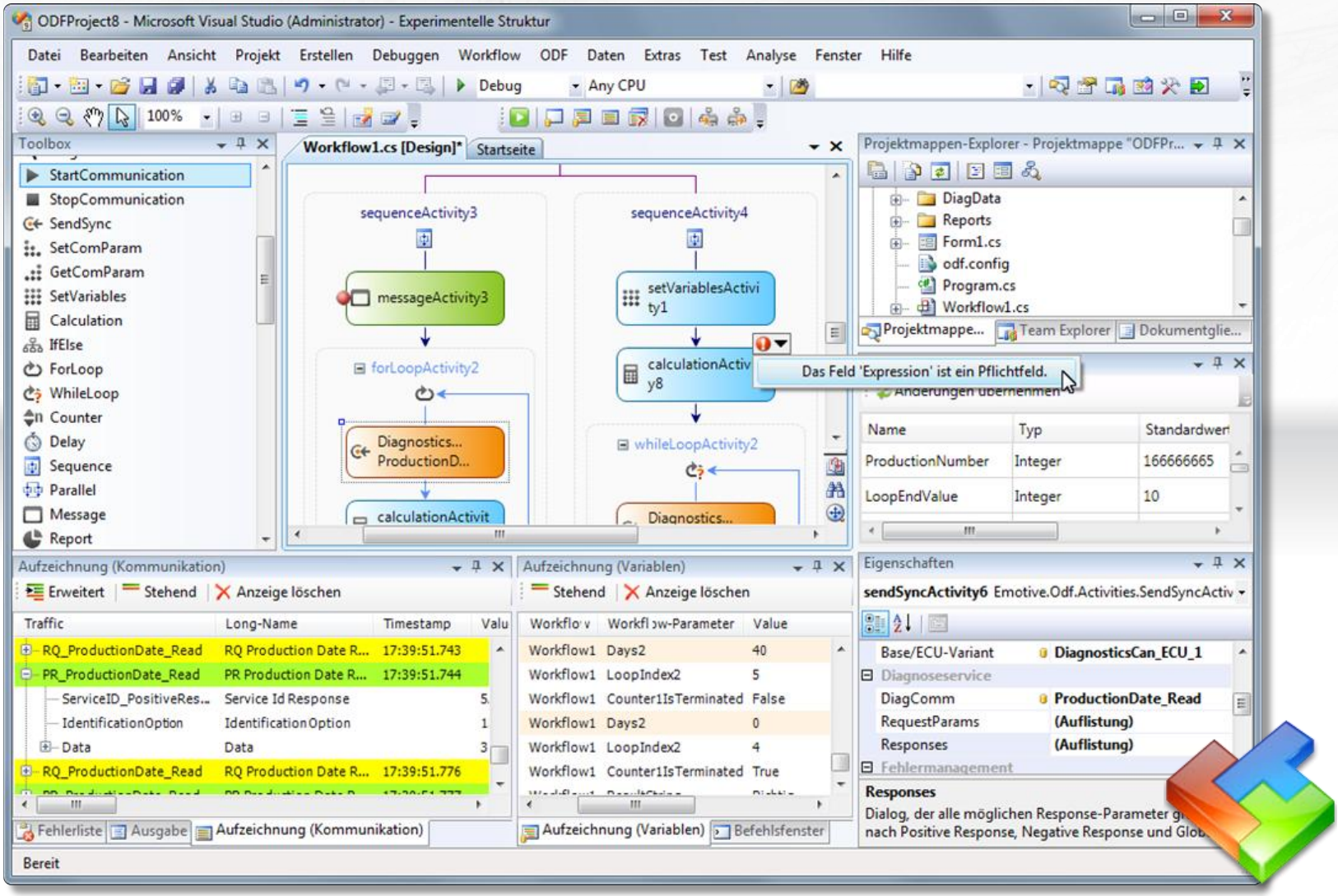


*SDX = Simple Diagnostic Data Exchange
Format by emotive to support proprietary Diagnostic Runtime Systems

Features

- Managing diagnostic sequences:
  - Easy graphical creation, specification, test and debugging of diagnostic sequences
  - Generation of executable program code of high performance
  - Full support of OTX and ODX
  - Comprehensive input validation at design time
  - Comprehensive standard and diagnostic specific activity libraries
- Simulation, stimulation, and communication analysis:
  - Universal development tester
  - High performance, optimized handling of resources, multi-channeling
  - Monitoring of diagnostic data and bus communication
  - PDU simulation for use without plugged hardware
  - Independent of diagnostic runtime system
  - Diagnostic runtime system included
  - Wide support of diagnostic interfaces
- Creating stand-alone diagnostic applications:
  - Graphical creation of graphical user interface (GUI) and data binding to diagnostic sequences for in- and output
  - Creation of slim and stand-alone Microsoft Windows executables (*.exe) of high performance
  - Integrated user management
  - Language manager to localize applications
  - Open and modern development environment (Visual Studio 2008)
  - Simple distribution of the created application
- General:
  - Comprehensive reporting (HTML, PDF, SQL)
  - Simple installation on target system via MSI or MSM
  - Multi-lingual (de, en)
  - User documentation
  - Offering trainings

Demonstration



Summary

- OTX & ODX provides a complete data-driven solution for the whole diagnostic process chain
- Diagnostic development process more process-safe, simpler and more productive
- OTX requires the support of an appropriate graphical software tool
- The Open Diagnostic Framework is an OTX and ODX based development environment for the diagnostic process chain
  - Easy graphical creation, specification, test and debugging of diagnostic sequences
  - Generation of executable program code of high performance
  - Generic creation of stand-alone diagnostic tester applications
  - Easily extendable at each layer

Thank You for Your Attention!

Contact us!

We can help out.

www.emotive.de