Partnership in Competence.

embeX
Your embedded experts

Welcome!

European Spallation Source

Overview

1. Facts on embeX and its markets
2. Core competencies and services
3. Development process and technologies
4. Cooperation with embeX
   References and projects

The company

- founded: October 2001
- owner and CEO: Jürgen Wiegand
- location: Freiburg im Breisgau
- about 130 employees (ca. 60% SW, 40% HW)

From the idea to the certified product

Our development services include these phases:

- concept
- specification
- realization
- verification (and certification support)
- start of serial production
- maintenance

Markets - our business units

- BU 1: Avionics and Transportation
- BU 5: Medical Engineering
- BU 6: Process Automation
- BU 7: Industrial Automation

Turnover distribution in our 10th year

We are certified


ZERTIFIKAT

DQS GmbH

embeX GmbH

Qualitätsmanagementsystem

ISO 9001:2008


TÜVRheinland®

ZERTIFIKAT
CERTIFICATE

FUNCTIONAL SAFETY MANAGEMENT
- IEC 61508 -

Nr.: 968/FSM 117.00/09

- Certification of our quality management system with respect to ISO 9001:2008
- Certification of our functional safety management with respect to IEC 61508 (by TÜV Rheinland)
- Certification of our quality management system for medical devices with respect to ISO 13485
- IRIS certification for the development of devices for railway systems

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Our services

Development:

- System concept and feasibility study
- Specification and requirement management
- Safety concept
- Architecture and design
- Realization: coding, layout, prototypes
- Functional tests, failure insertion tests, SW module tests
- EMC and environmental tests
- Analysis: risk analysis, FMEDA
- Certification with: TÜV, IfA, UL, FDA, DVGW, EASA …
- Transfer to serial production and maintenance

… additionally:

- Consulting, training
- Inclusion of additional competences through our partner network: construction, manufacturing, PC software, …

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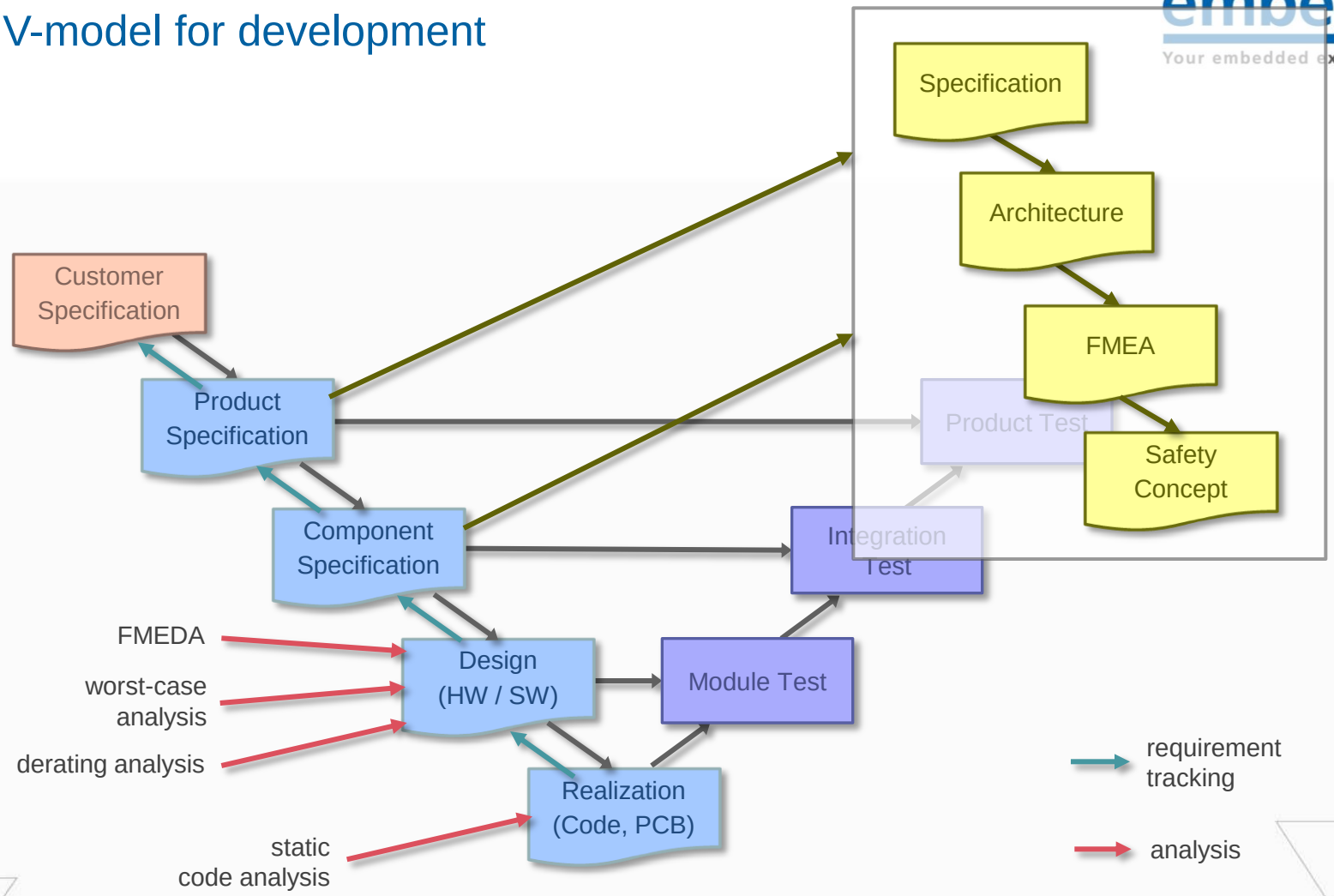
The V-model for development



The phase model for development

Demonstrator
- „rough and ready“
- for demonstration of feasibility

Functional Prototype
- using evaluation boards
- Evaluation of the HW concept
- Base for SW development

Prototype
- Form and function of the serial devices
- object for assessment

Pilot series
- from serial production plant

Serial production
- …

Technologies - platforms

RTOS:

- embOS, VxWorks, ThreadX, µCOS, EUROS, Sciopta, eLinux, …

Run-time environment for application programs:

- CoDeSys (3S), SafeOS (KW)

FPGA:

- XILINX, ALTERA, LATTICE

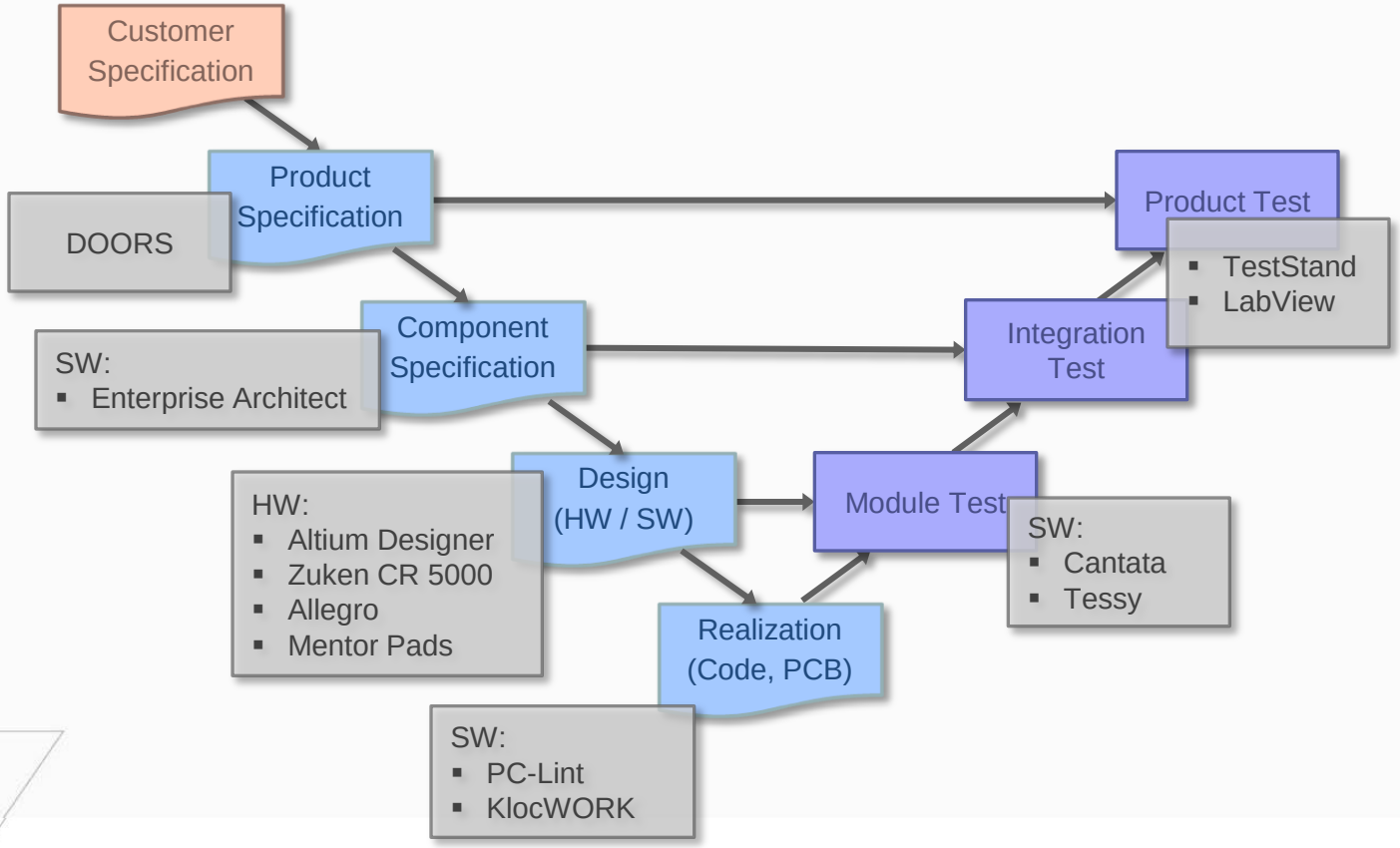
Microcontroller:

- Analog Devices: ADµCxxxx, ADSPxxxx, Blackfin
- Atmel: ATmega, AT91SAMxxxx
- Cypress: CY8Cxxxxx
- Freescale: Coldfire, PowerPC, 68HC12x, 68xxx
- Infineon: XC16x, C16x, TriCore
- Microchip: PIC12, PIC16, PIC18, PIC 24, dsPIC
- Philips-ARM: LPC 21xx, LPC 229x

Technologies - communication

USB

Technologies - Tools



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Typical project run

- Execution of work at embeX in Freiburg
- Involvement of the customer by
  - Reviews
  - Bugtracking, e.g. Mantis, Bugzilla
  - Status reports at the end of the month or with the planned milestones
- Concept phase: specification, safety concept, V&V plan, FSM plan
- Planning of milestones and resources in coordination with the customer
- Realization phase
- If required: support for assessment and certification with: TÜV, UL, IfA, FDA, EASA, EBA, ...
- All results of development are delivered: code, test drivers etc.
- Production start
- Maintenance through the whole life-cycle

Example - industrial automation

Modular programmable logic control

Safety in Automation

Technology	SafeOS, ARM7, safe I/Os
embeX	development of hardware and software specification and realization of a safety protocol support for assessment and certification
Approval	CE (TÜV Rheinland), UL, GL
Standards	IEC 61508 (SIL 3, high demand)
	ISO 13849-1 (PL e)
	IEC 62061 (SIL-CL 3)

Examples - robotic

Control platform for robots in industrial automation

Safety in Automation

Technology	SafeOS Control MCU, resolver evaluation, safe I/Os
embeX	Safety concepts FMEDAs
Approval	CE (TÜV Süd)
Standards	IEC 61508 (SIL 2/3, high demand) ISO 13849-1 (PL d/e) IEC 62061 (SIL-CL 2/3)

Example - avionics

Electronic pitch control system for helicopters

Avionics & Railway

Technology	FPGA, PowerPC, complete threefold redundancy
embeX	development of hardware, software, and firmware for a functional prototype
Standards	DO-178C, DO-254 (in the future)

Thank you.

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