



Section 2, Process Management

Tool Suite eASEE – from Modules to Solutions

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The eASEE Tool Suite – from Modules to Solutions

Agenda

- ❑ Introductory Remarks
 - ❑ Why a tool like eASEE?
 - ❑ What is eASEE?
 - ❑ What drives Vector to develop eASEE?

- ❑ The eASEE Tool Suite
 - ❑ Big Picture
 - ❑ The Automotive fit
 - ❑ Two examples, how eASEE addresses Automotive challenges

- ❑ Stages of the eASEE Development
 - ❑ eASEE development over time
 - ❑ Benefit of eASEE modules
 - ❑ eASEE “Out-of-the-Box” solutions

- ❑ Integrated Solutions – Alternatives for the Customers



The eASEE Tool Suite – from Modules to Solutions

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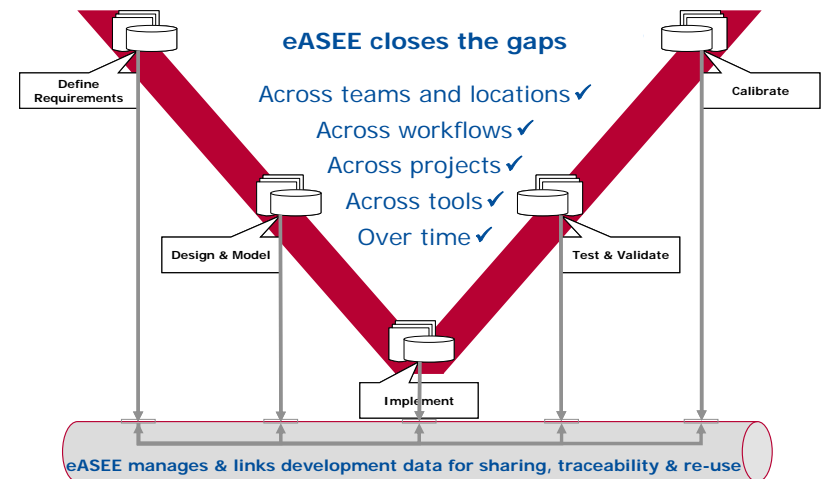
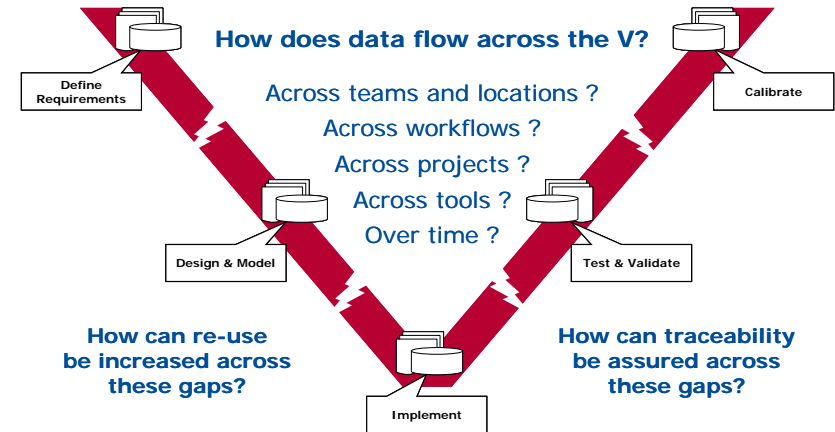
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Introductory Remarks

Why eASEE?

- ❑ **Processes** are needed, to ...
 - ❑ implement repeatable stages of work
 - ❑ realize continuous efficiency and quality improvements
 - ❑ organize distributed development
 - ❑ establish platform strategies
- ❑ **Tools** are needed, to ...
 - ❑ institutionalize processes as a normal environment for the engineer's daily work.
- ❑ **eASEE** is needed, to ...
 - ❑ implement stages of work in different disciplines along the "V" and on a common, consistent engineering data base.



Introductory Remarks

What is eASEE?

electronic **A**utomotive **S**ystems **E**ngineering **E**nvironment

- ❑ Pronounced “EASY”
- ❑ Product Lifecycle Management (PLM) just for automotive E/E and Powertrain development

What eASEE is ...

- ❑ a scalable, modular, client/server system to:
 - ❑ Manage engineering data on the file level and on the data object level
 - ❑ Automate and deploy development process workflows
 - ❑ Integrate different development tools
 - ❑ Coordinate teams of developers across multiple global locations
- ❑ a compliment to established enterprise-wide PLM systems e.g. for released data
- ❑ a flexible, configurable platform with smart application modules

What eASEE is NOT ...

- ❑ a replacement for existing development tools like:
 - ❑ Matlab/Simulink, CANoe, compilers, debuggers, INCA, data loggers, etc.
 - ❑ Vector embedded software, AUTOSAR, code generators, etc.
- ❑ a replacement of established enterprise-wide PLM systems
- ❑ a fixed or closed system that everybody sees the same way

Introductory Remarks

Drivers for Vector – goals of our customers, whose achievement Vector supports

Increase ...

- ❑ efficiency by non-redundant data entry and data maintenance.
- ❑ speed by fast answers to scenario questions.
- ❑ transparency by integration of engineering and planning data.
- ❑ product quality by repeatable, process compliant, role-specific stages of work, e.g. supported by workflows and quality gates.
- ❑ process quality by seamless traceability across the "V".
- ❑ team satisfaction by increased data consistency, security and enhanced features for retrieval.

Decrease ...

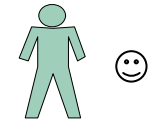
- ❑ efforts for customer-specific tool development.
- ❑ integration efforts for data exchange between isolated tools.
- ❑ IT costs (investment, maintenance, support) for multiple tools and multisite concepts.
- ❑ time between process definition and process implementation for productive use.



Engineer



Management



IT

The eASEE Tool Suite – from Modules to Solutions

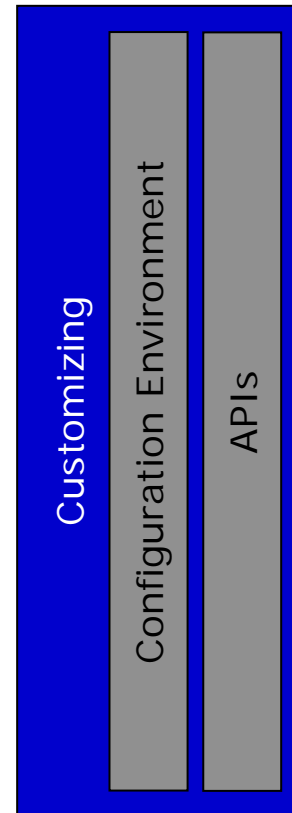
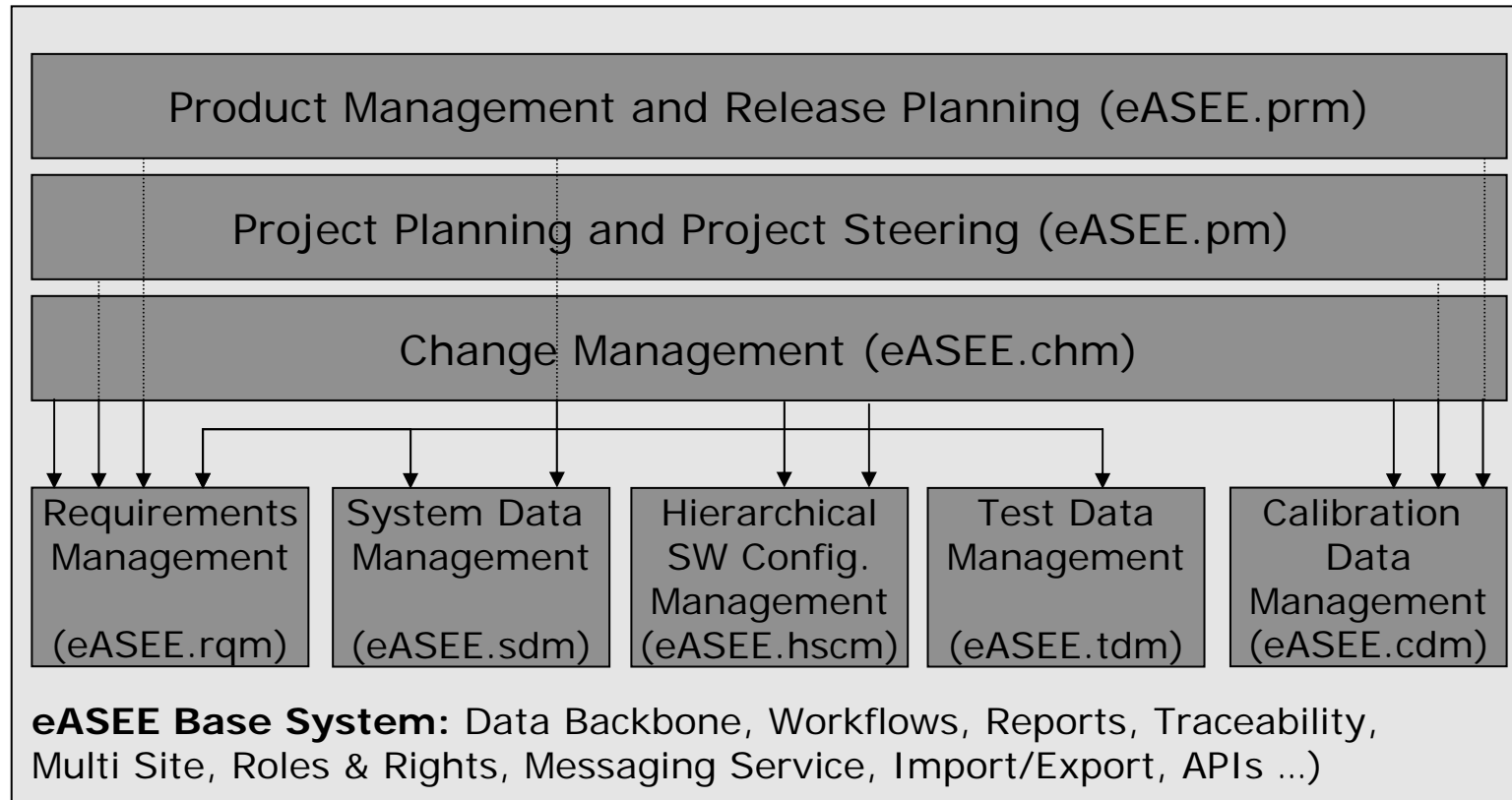
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The eASEE Tool Suite

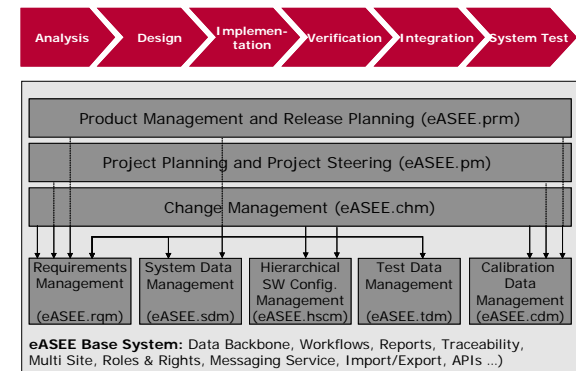
Big Picture



The eASEE Tool Suite

eASEE Modules

- ❑ The eASEE modules offer pre-implemented functionality for the most important Automotive process disciplines.
- ❑ eASEE modules ...
 - ❑ cover the Automotive mainstream functionality.
 - ❑ implement the best practices from many customers.
 - ❑ reduce development efforts of customers.
 - ❑ are developed in close collaboration with noted development partners (Bosch, MAN, Volvo Car, Ford Research, Blaupunkt).



The eASEE Tool Suite

The Automotive fit

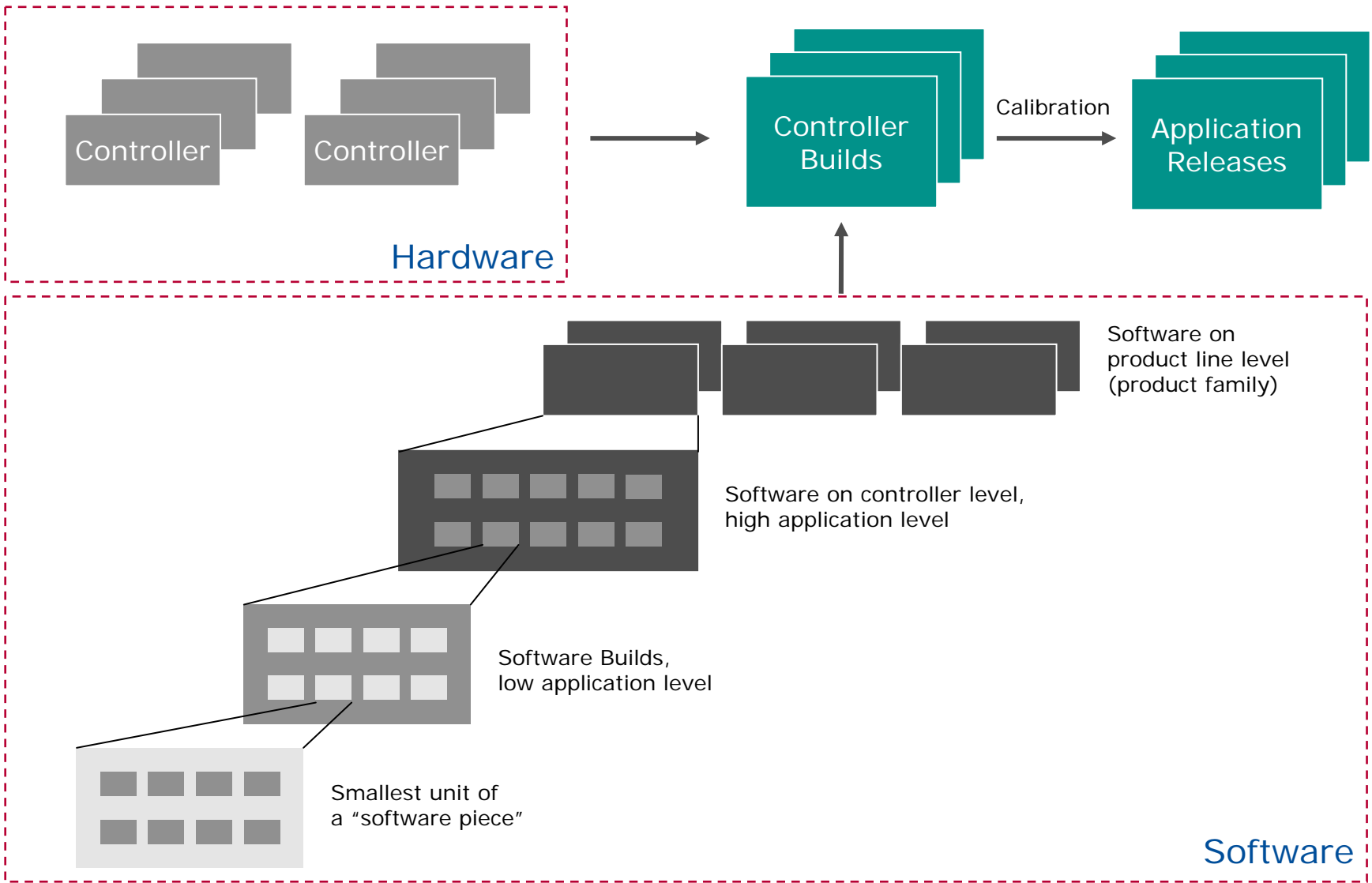
The eASEE Tool Suite is Automotive specific:

- ❑ **Automotive specific modules**
 - ❑ eASEE.hscm, eASEE.sdm, eASEE.cdm
- ❑ **Supported Standards**
 - ❑ MSR, AUTOSAR, FIBEX, DBC, ODX, ASAM-MCD 2, RIF, ...
- ❑ **Supported processes**
 - ❑ Function-oriented development
 - ❑ Linking requirements to architecture
 - ❑ Productline/Platform Approach
- ❑ **Implemented data models**



The eASEE Tool Suite

Challenge: Automotive Build of Material and Configuration Management

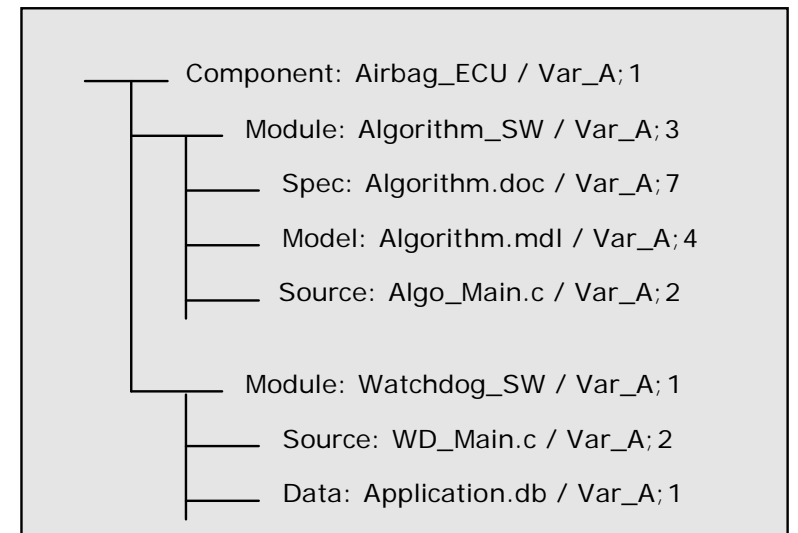
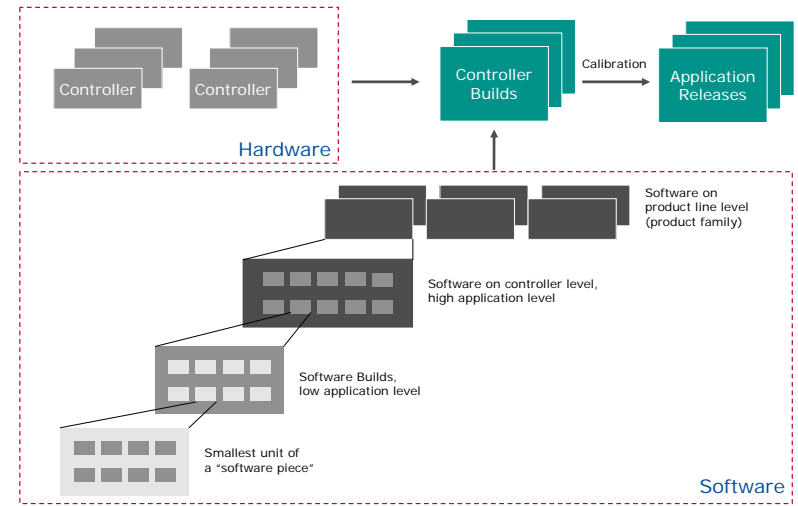


The eASEE Tool Suite

Managing the challenge with eASEE.hscm

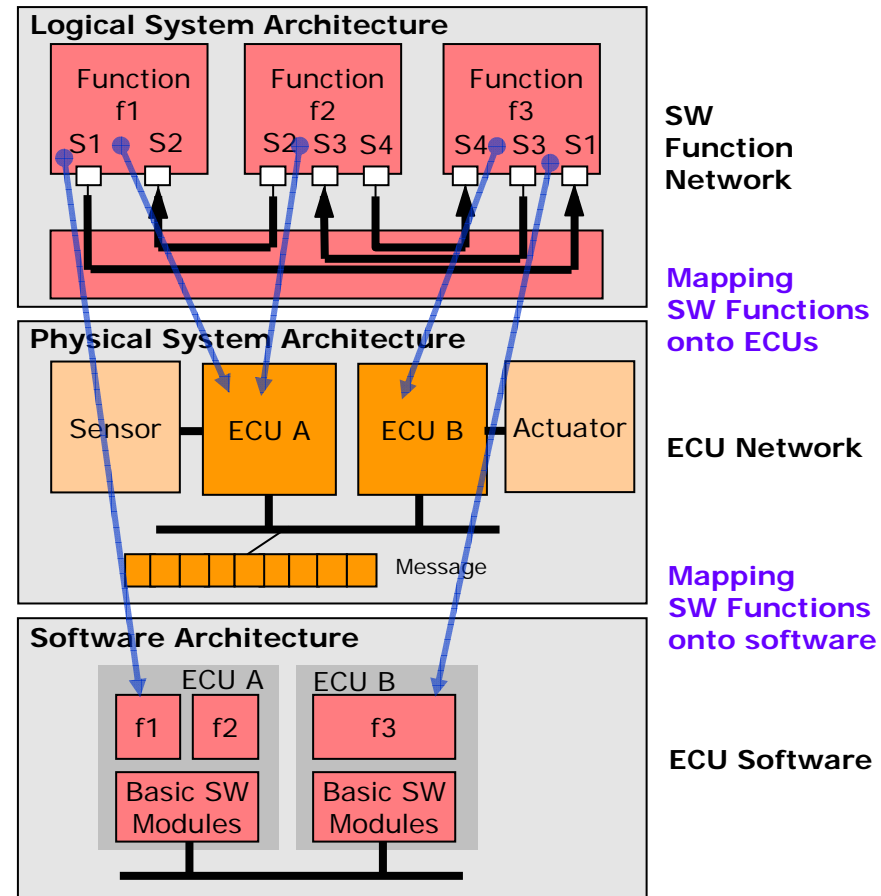
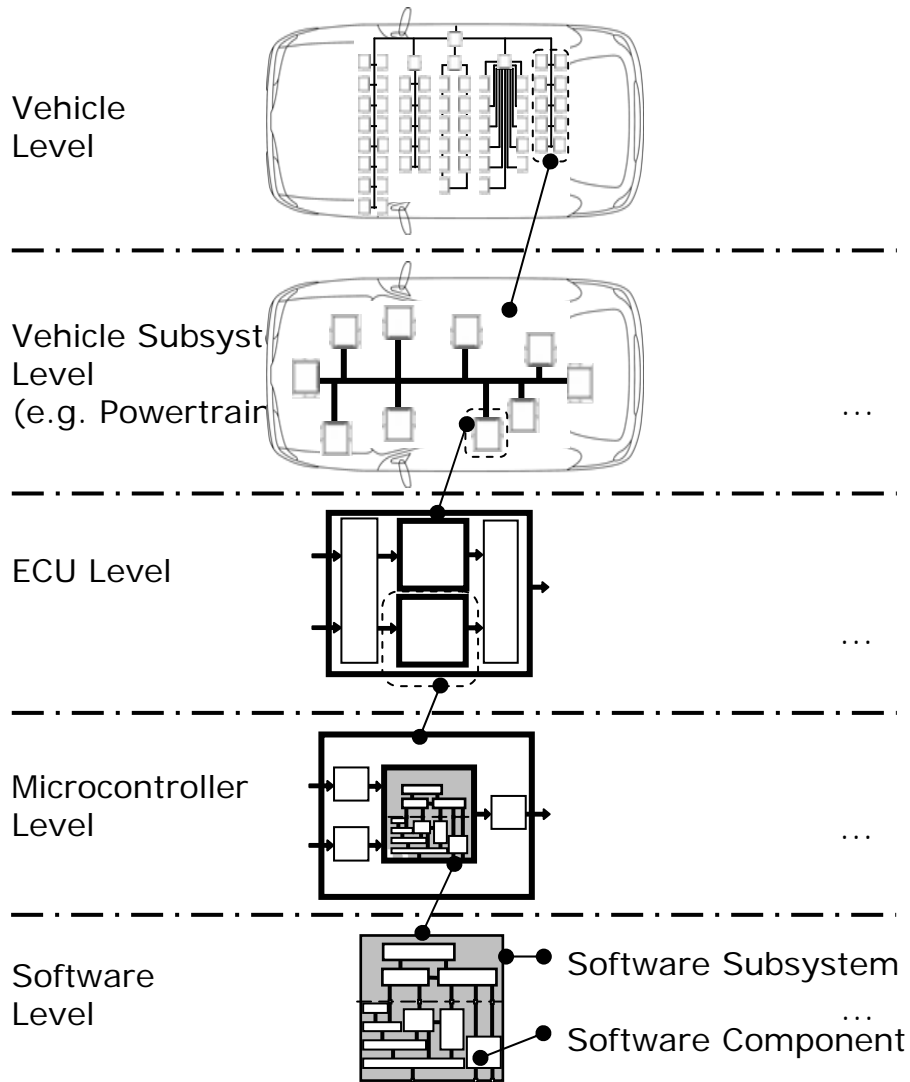
eASEE.hscm supports:

- ❑ Hierarchical versioning of containers instead of “flat” labeling software versions
- ❑ “Build of Material” functionality
- ❑ Check-in / Check-out of complete structures with one click
- ❑ Traceability between Requirement, Function and Source Code
- ❑ Reuse supported
- ❑ Sophisticated variant management
- ❑ Parallel teamwork in private objects



The eASee Tool Suite

Challenge: Automotive System Engineering

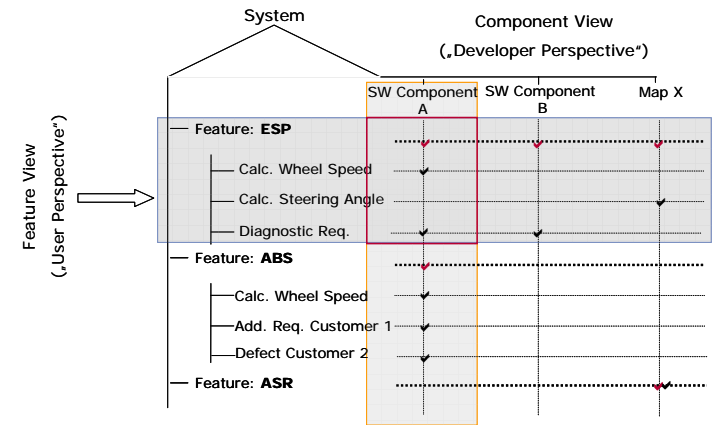


The eASEE Tool Suite

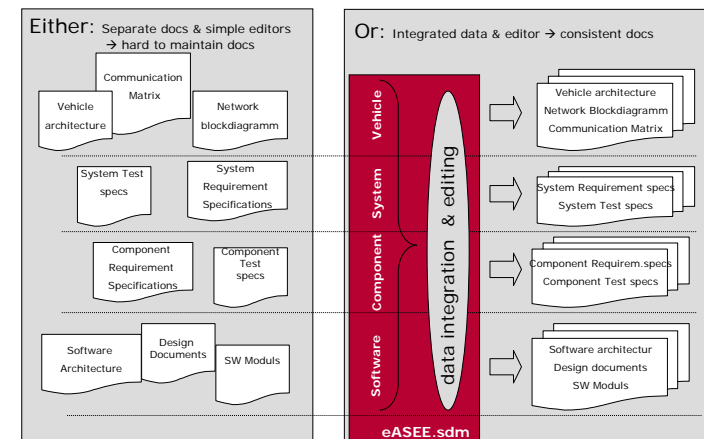
Managing the challenge with eASEE.sdm

- ❑ Use Case 1
 - ❑ Team Environment for Specification and Design of ECU Networks and ECU Communication
- ❑ Use Case 2
 - ❑ Team environment for hierarchical decomposition of features, relations of requirements to features to functions; versions & variants; History
- ❑ Use Case 3
 - ❑ Engineering data backbone for function developers
- ❑ Use Case 4
 - ❑ Specification of the complete E/E-architecture; support of Function-oriented and ECU-centric perspective; validation and consistency checks on function, ECU and E/E system level; reuse of ECU and functions in several product lines

eASEE.sdm: Software Architecture



eASEE.sdm: Documentation



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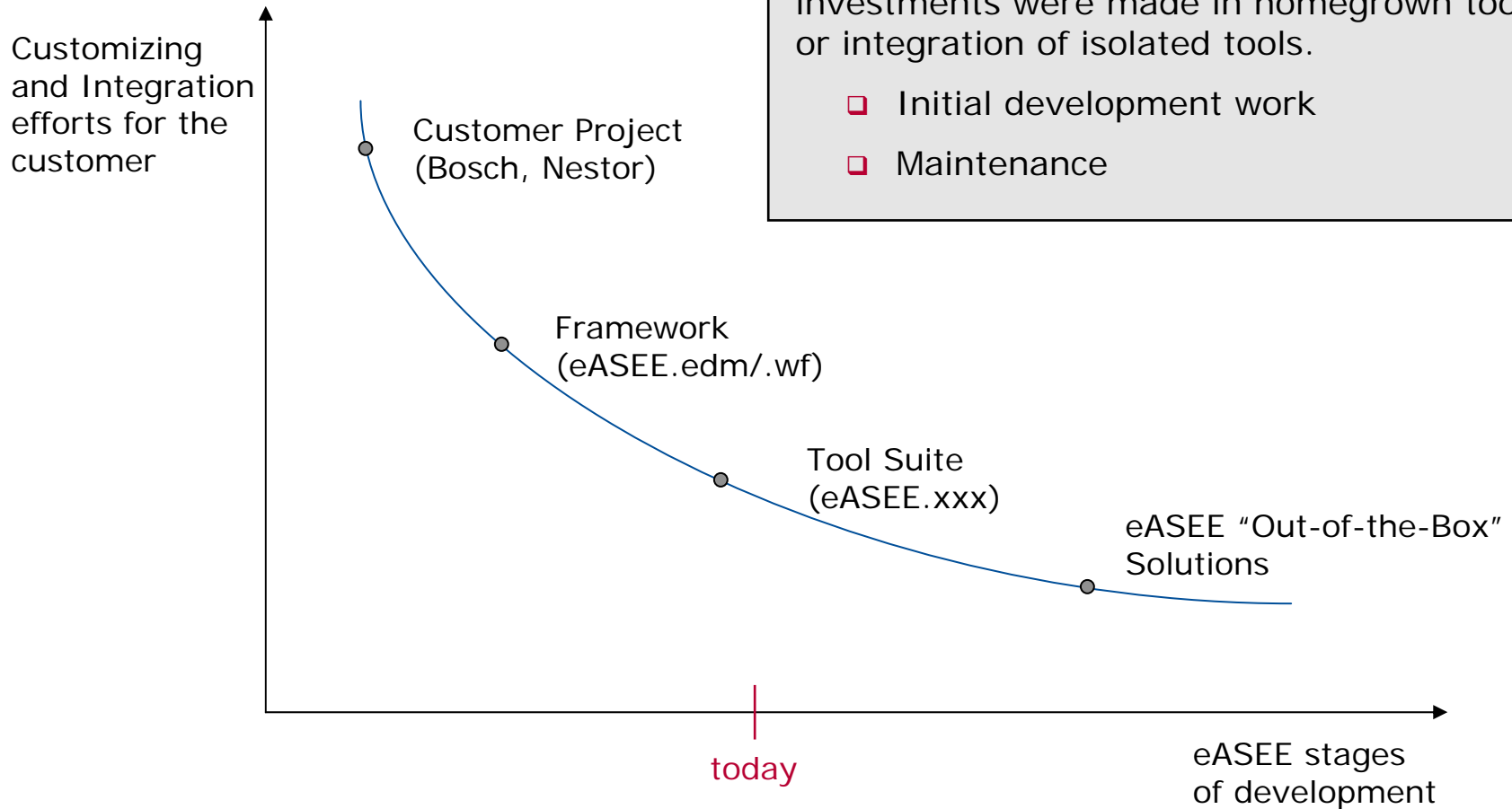
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Stages of eASEE Development

Driver: Reduce customization efforts

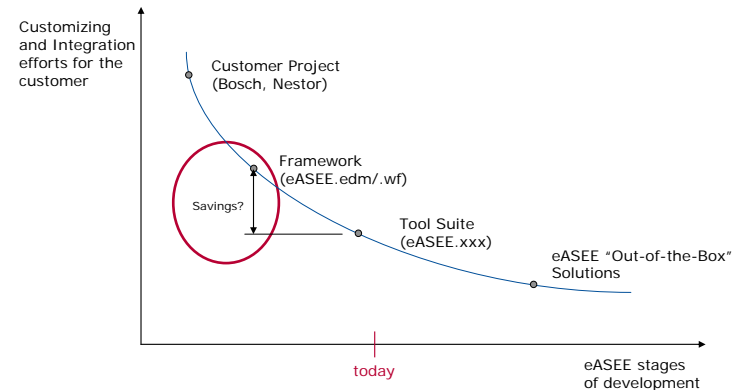


Stages of eASEE Development

Savings for the customer by eASEE modules

- ❑ Proprietary solution for system data management
 - ❑ 5 years development with 120 T€ invest per year: 600 T€
 - ❑ In average 30 user: 20 T€/user
 - ❑ Coverage by the first version of eASEE.sdm (V1.0)
 - ❑ Data model: ~ 70%
 - ❑ Functionality: ~ 25%
 - ❑ In total: ~ 35%
 - ❑ Calibrated to eASEE.sdm V1.0 7 T€/user

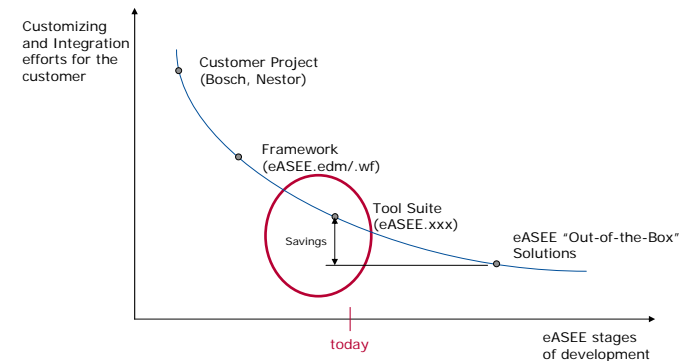
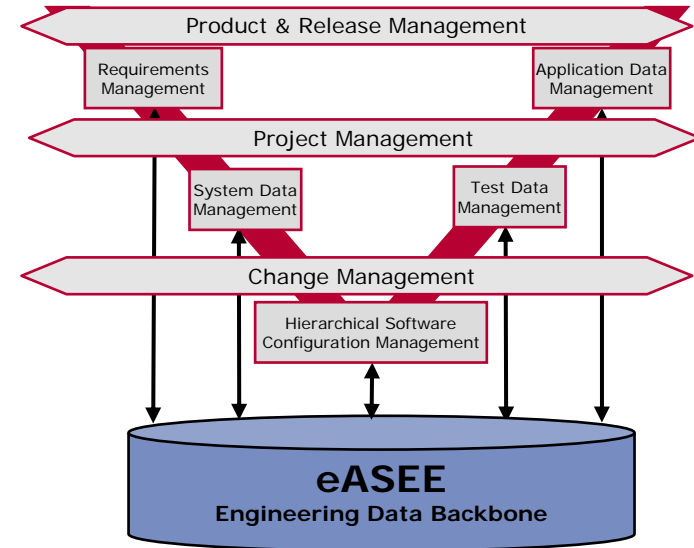
- ❑ Product solution for system data management eASEE.sdm V1.0
 - ❑ List price per license: 2 T€/user
 - ❑ Savings: ~ 70%



Stages of eASEE Development

From eASEE modules to eASEE "Out-of-the-Box" solutions

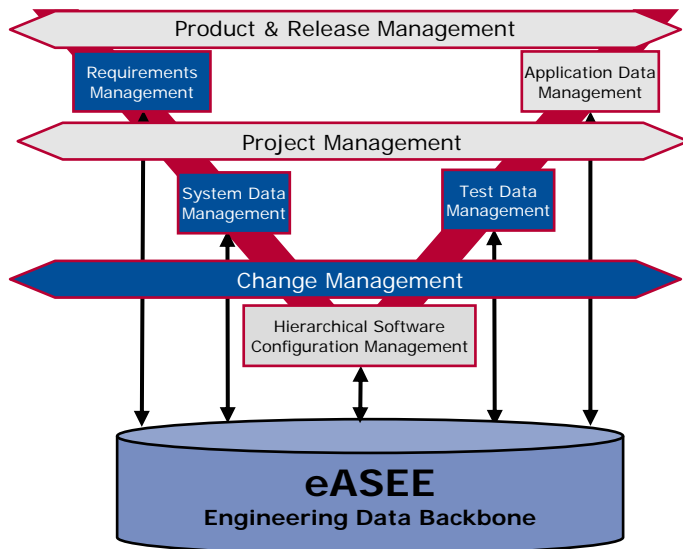
- ❑ Today's situation
 - ❑ eASEE modules for certain application areas.
 - ❑ Each module has it's own data model.
 - ❑ Common data management with one base system for each module and a domain concept.
- ❑ Next potential for cost savings: **eASEE "Out-of-the-Box" solutions**
 - ❑ Modules pre-integrated
 - ❑ Cross-module data model



Stages of eASEE Development

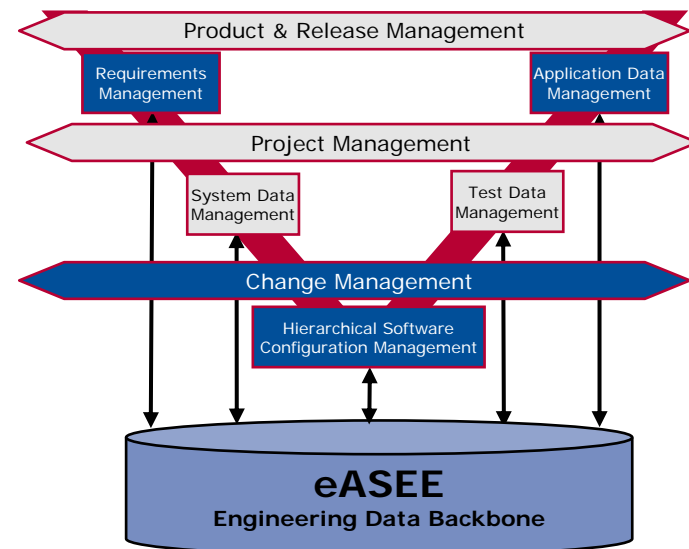
From eASEE modules to eASEE "Out-of-the-Box" solutions

eASEE Solution for Automotive Systems Engineering



Pilot Customers: MAN, Volvo Car

eASEE Solution for Automotive ECU Development



Pilot Customer: Bosch

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The idea behind eASEE is right

- ❑ Nearly all Automotive companies see the need for the next generation of process tools.
- ❑ The time of investments in isolated tools is over.

Vector sees the following approaches to meet the customers needs in the area of Electric/Electronics and Powertrain

1. One customer-wide process and backbone solution as an extension, coming from solutions from the field of mechanical engineering (Siemens Teamcenter, Matrix-X, ...).
2. Specific solutions, which collaborate with these enterprise-wide backbones
 - a) Well circulated tool suites coming from the area of Software Engineering (MKS, Rational, Telelogic, ...)
 - b) E/E and Powertrain specific solution, designed by Automotive Engineers for Automotive Engineers (Vector with eASEE)

The Customer will decide, which approach is the right one.

Thank you for your attention.

For detailed information about Vector
and our products please have a look at:

www.vector-informatik.com

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