Kapitelübersicht

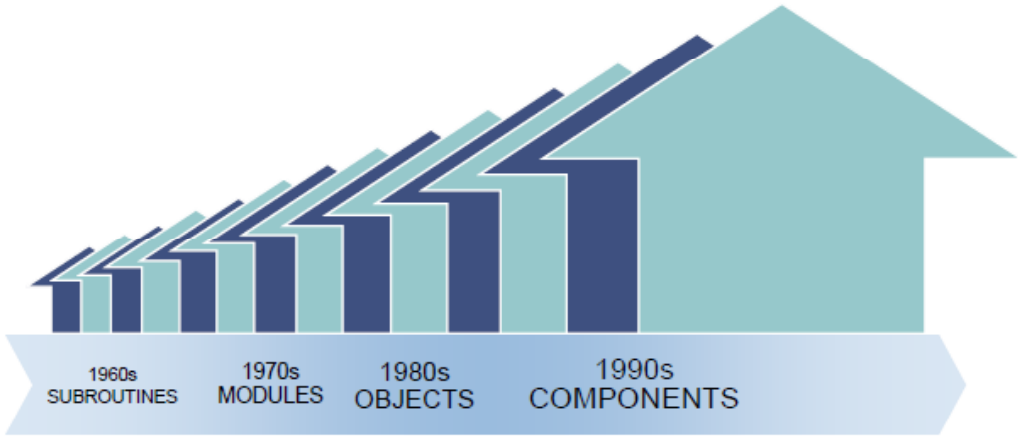
1.	Einführung	- Prof. Zimmermann
2.	Aspekte des Systementwurfs	- Prof. Zimmermann
3.	Modellbasierter Entwurf	- Prof. Zimmermann
4.	Echtzeitsysteme	- Prof. Zimmermann
5.	Scheduling	- Prof. Zimmermann
6.	Sicherheit und Zuverlässigkeit	- Prof. Zimmermann
7.	Softwaretechnische Aspekte	- Prof. Fengler
8.	Hardware-Software-Codesign	- Prof. Fengler
9.	Rechnerarchitekturaspekte	- Prof. Fengler
10.	Kommunikation	- Prof. Fengler
11.	Energieeffizienz	- Prof. Fengler
12.	Domäne Automotive	- Prof. Fengler

1. Vorgehensmodelle
2. Echtzeit Programmierung
3. Testen
    1. Allgemeines
    2. Remote Debugging
    3. In Circuit Emulation
    4. Hardware in the loop / Software in the loop
    5. JTAG
4. Autosar
5. Produktlinien (W. Fengler, M. Farrag)

KES

Reuse History

- 1960s
- SUBROUTINES
- 1970s
- MODULES
- 1980s
- OBJECTS
- 1990s
- COMPONENTS



Focus was small-grained, opportunistic, and technology-driven.
Results did not meet business goals.

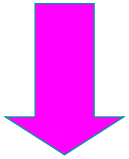
Software Product Lines, Essentials, Linda Northrop,
Software Engineering Institute, Carnegie Mellon University,
Pittsburgh, PA 15213-2612

Product Lines - Motivation

- Software is becoming complex
- Reuse is becoming an imperative
- Mass customization – producing goods and services to meet individual customer's needs – should be done with near mass production efficiency

Handcrafted for individual customers

Production Line – Mass Production

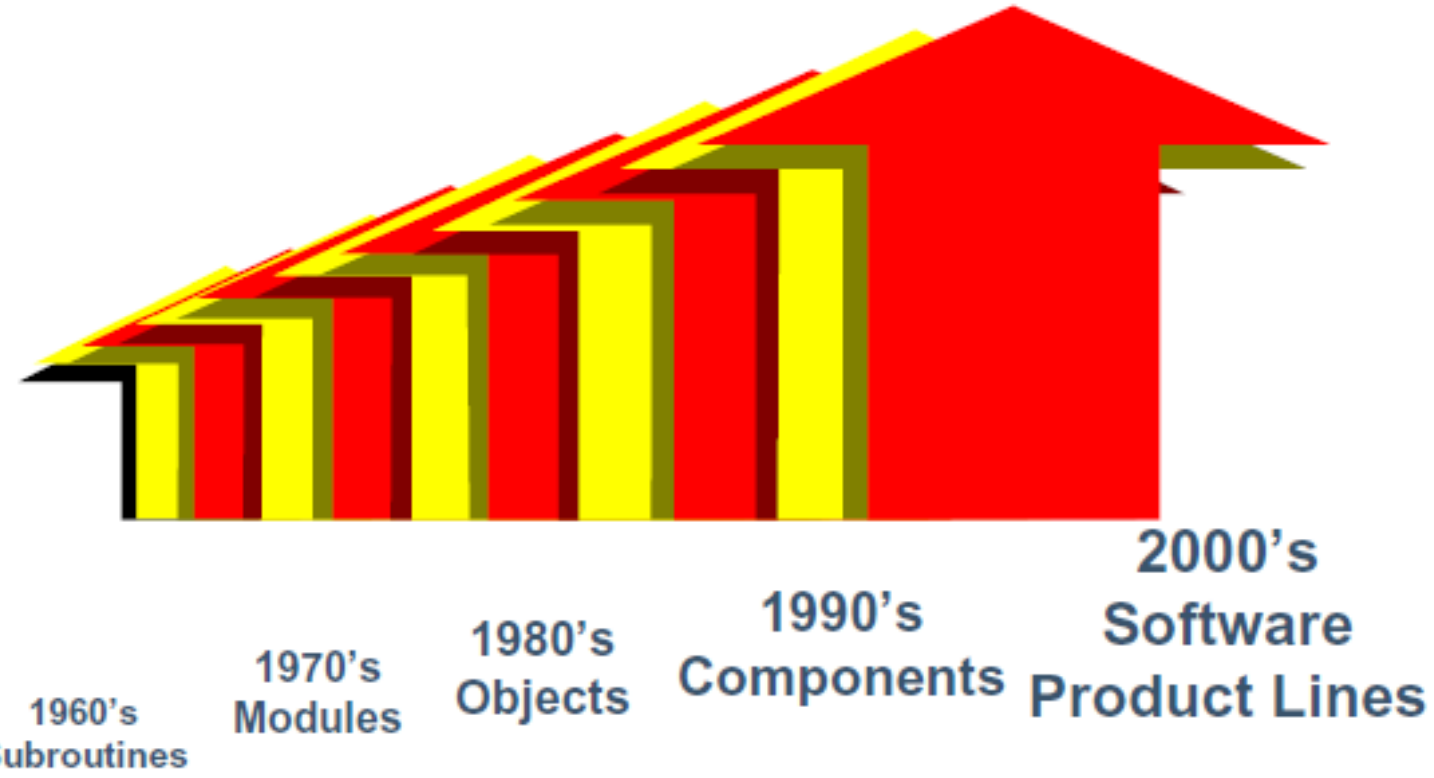


Mass Customization: large-scale production tailored to individual customers' needs

Julia Rubin, Tali Yatzkar-Haham, and Uri Avraham, Model Driven Engineering Technologies, IBM Haifa Research Lab

KES

Reuse History: From Ad-Hoc to Systematic



PRODUCT LINES = STRATEGIC REUSE

- Successful software product lines have been built for families of among other things

- mobile phones
- command and control ship systems
- satellite ground station systems
- avionics systems
- command and control/situation awareness systems
- pagers
- engine control systems
- mass storage devices
- billing systems
- web-based retail systems
- printers
- consumer electronic products
- acquisition management enterprise systems
- financial and tax systems
- medical devices
- farm fish management software

Software Product Lines, Essentials, Linda Northrop, Software Engineering Institute, Carnegie Mellon University, Pittsburgh, PA 15213-2612

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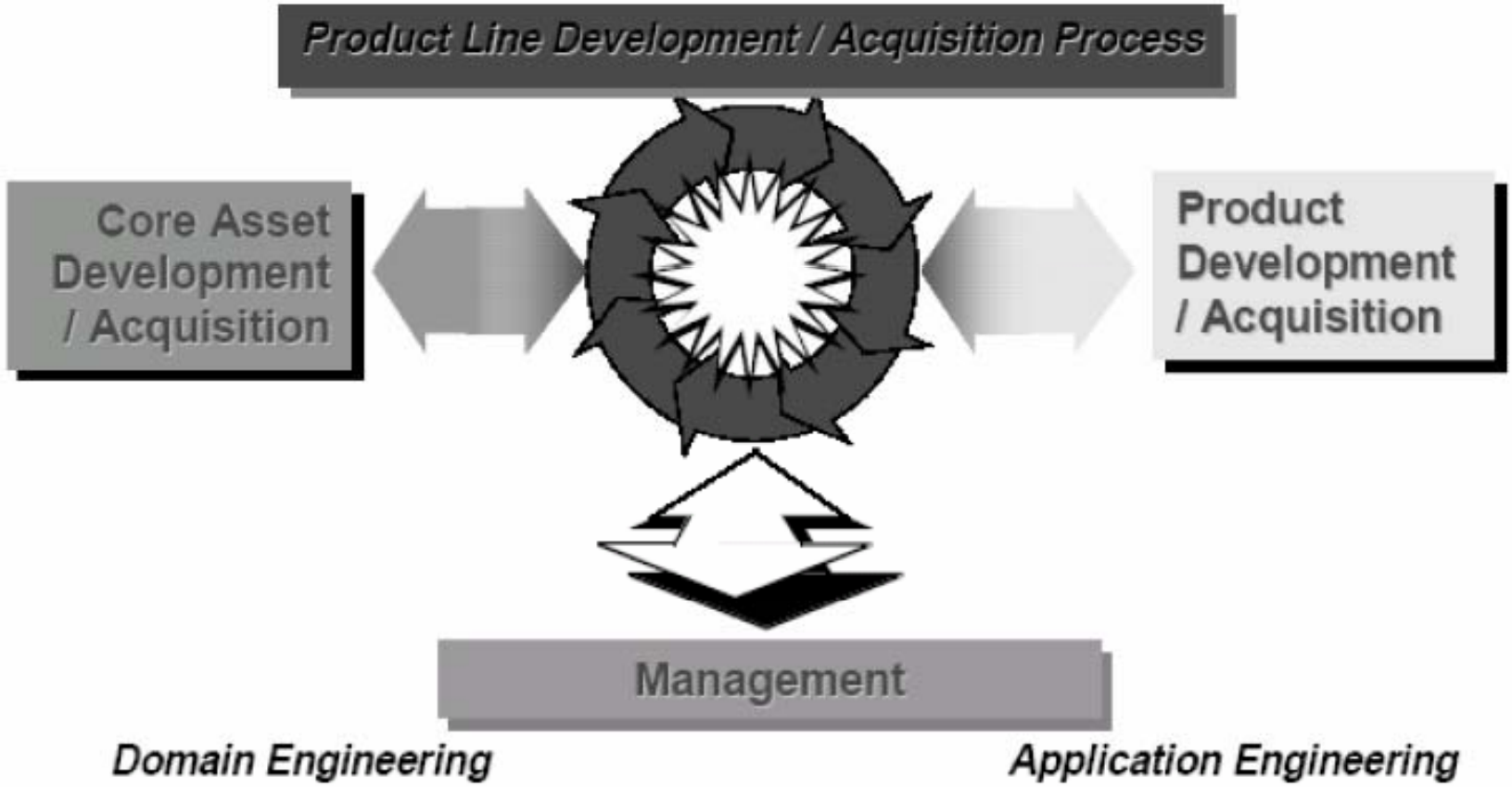
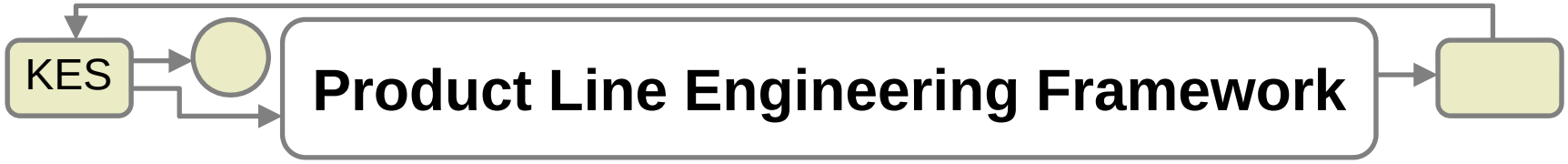
The Three Essential Activities



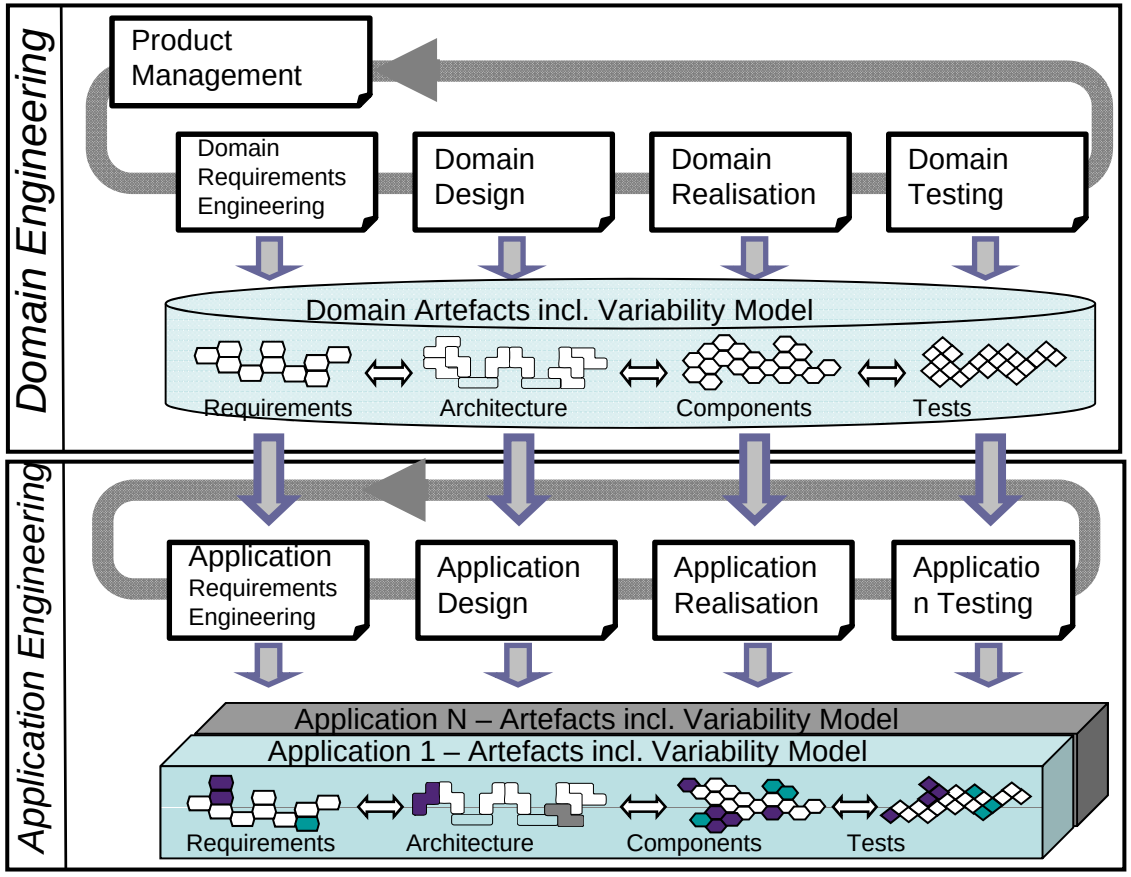
Introducing product line architecture in product development, Date 24-09-08, Workshop 4:30PM at 4A22, By Nok, Hataichanok Unphon



Product Line Engineering Framework

Domain Engineering:
Define and realize
the commonality
and variability.
The goal is to establish
a reusable platform

Application Engineering:
Reuse domain artifacts,
exploiting variability to build a
product.
The goal is to derive a product
from the platform established in
the Domain Engineering phase



Based on the “Software Product Line Engineering” book by Klaus Pohl,Günter Böckle and Frank J. van der Linden Julia Rubin, Tali Yatzkar-Haham, and Uri Avraham,Model Driven Engineering Technologies, IBM Haifa Research Lab

Feature Model Example

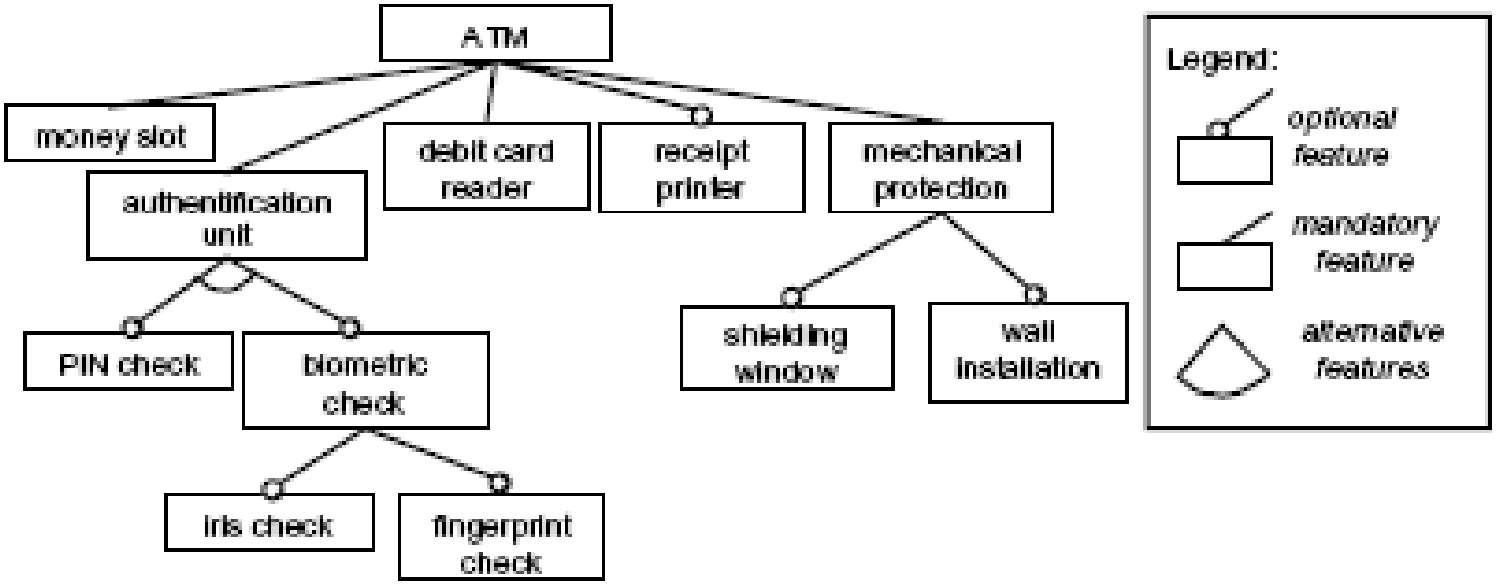


Fig. 1. Feature Model Example

Aus: Modeling variability for object-oriented product lines / Matthias Riebisch; Detlef Streitferdt and Ilian Pashov, Riebisch, u.a. Object-oriented technology . - Berlin [u.a.] : Springer, ISBN 3-540-22405-X. - 2004, S. 165-178

Product Line and Product Engineering Workflows

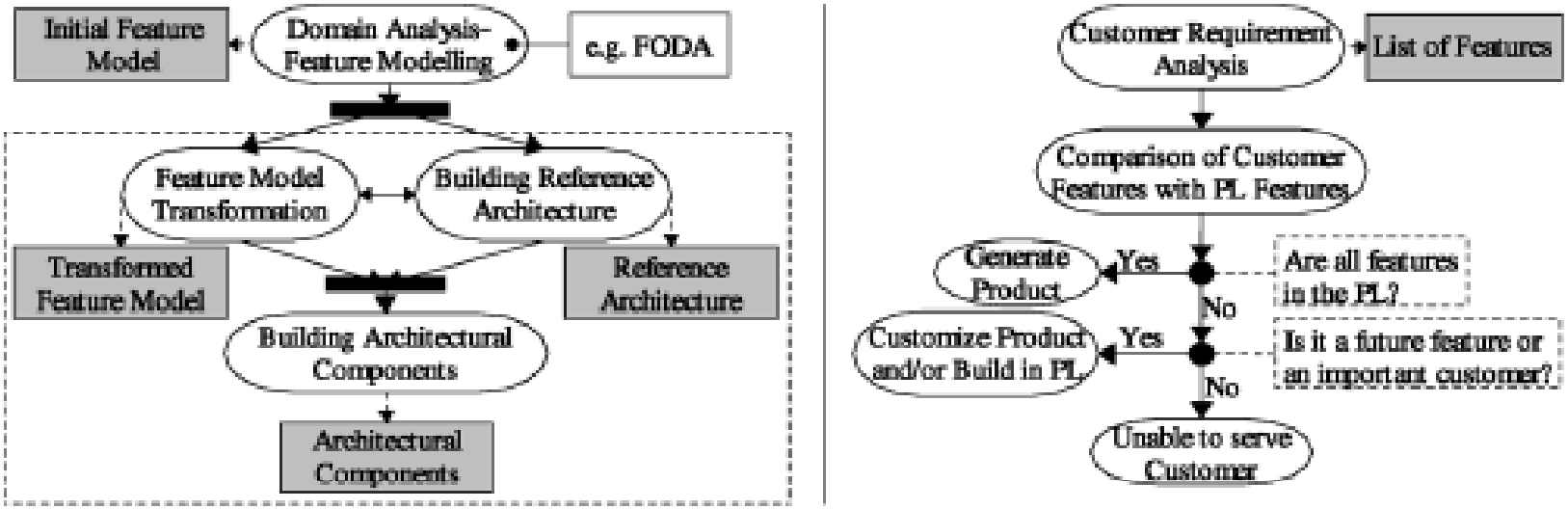


Fig. 6. The FArM Product Line and Product Engineering workflows

Aus: Feature-oriented development of software product lines : mapping feature models to the architecture / Periklis Sochos u.a. In: Object-oriented and internet-based technologies . - Berlin [u.a.] : Springer, ISBN 3-540-23201-X. - 2004, S. 138-152

Produktlinien und Autosar?

COMPETENCE CENTER FOR PROCESSES AND ARCHITECTURES

COMPET

PROCESS

WS 1: Variantenmanagement für und mit AUTOSAR

COMPARC Embedded – Perspektiven der AUTOSAR-Entwicklung

Stefan Mann

Fraunhofer-Institut für
Software- und Systemtechnik ISST Berlin

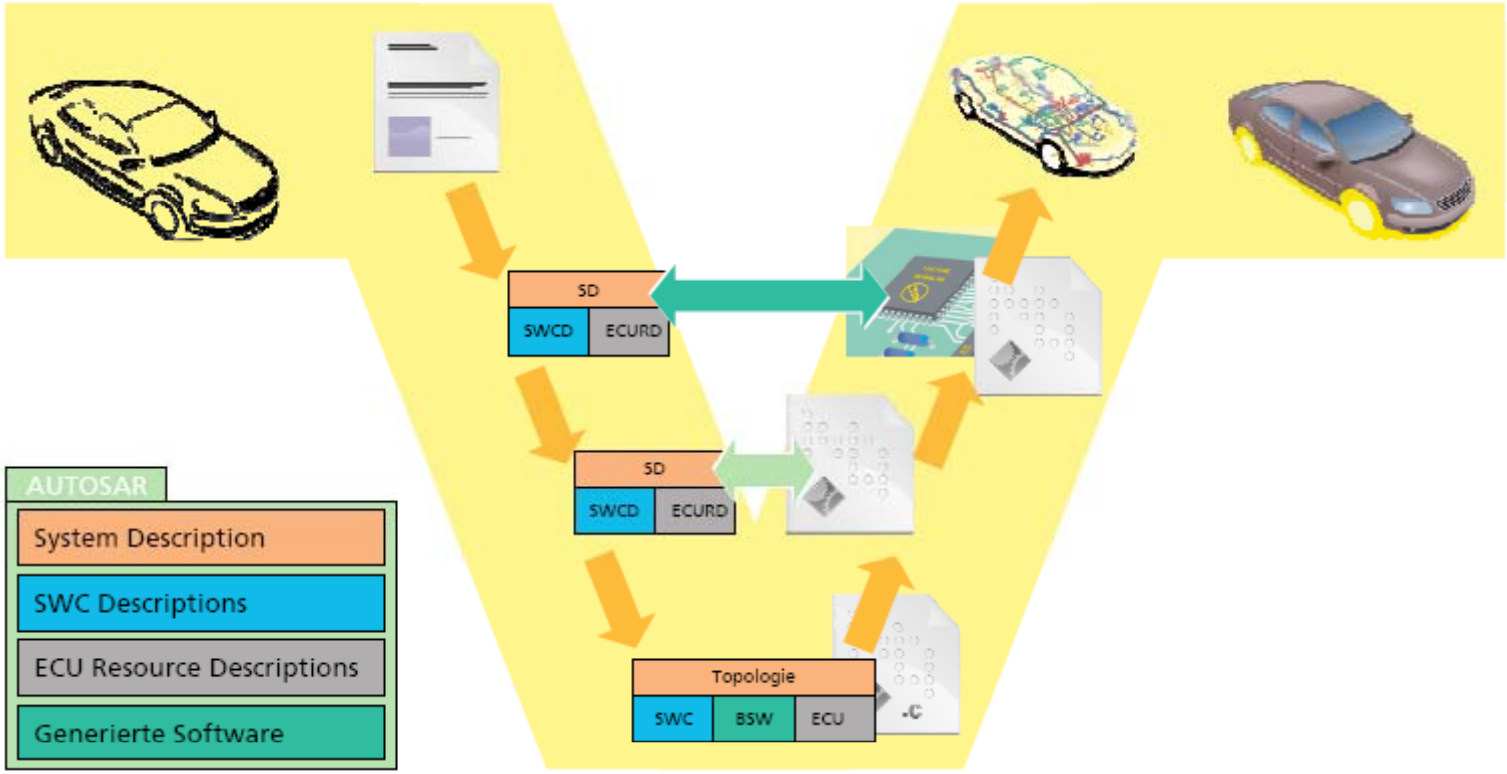
Fraunhofer-Forum Berlin, 29. Mai 2008

ISST

Fraunhofer Institut Software- und Systemtechnik

Produktlinien und Autosar?

AUTOSAR-Artefakte



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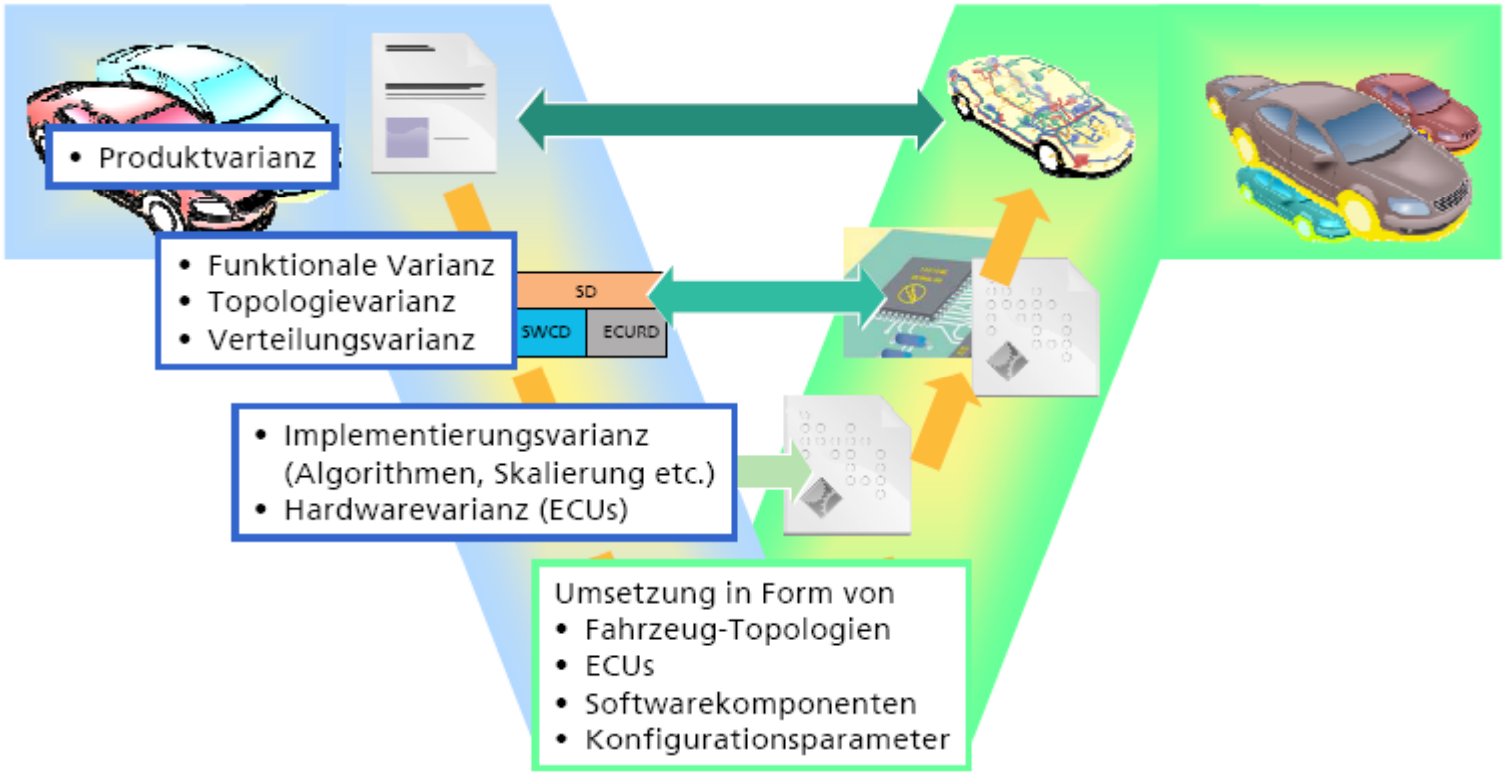
Produktlinien und Autosar?

Produktlinien



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Fengler, Zimmermann 03-2009

Produktlinien und Autosar?

Ergebnis des Workshops
WS 1 »Variantenmanagement für und mit AUTOSAR«

Thesen

AUTOSAR ist [ein / kein] guter Ausgangspunkt, um Variantenmanagement erfolgreich durchzuführen, weil …

Um Variantenvielfalt zu beherrschen, ist ein durchgängiges Variantenmanagement [nicht] notwendig, weil …

AUTOSAR [hat bereits alle / braucht unbedingt weitere / braucht keine] Bordmittel, um Variantenmanagement zu unterstützen, weil …

[Für] AUTOSAR [muss / sollte / definiert] [ein[en] / kein[en]] Produktlinienentwicklungsprozess [definiert werden / definieren], weil …

Fraunhofer ISST Institut Software- und Systemtechnik

- **Software Product Lines in Action: The Best Industrial Practice in Product Line Engineering**, **by Frank van der Linden, Klaus Schmid, Eelco Rommes**. Provides a description of the Families Evaluation Framework (FEF) and 10 case studies.
- **Software Product Line Engineering: Foundations, Principles, and Techniques**, **by Klaus Pohl, Günter Böckle, Frank van der Linden**. A comprehensive textbook on the key processes and activities of software product line engineering.
- **Software Product Lines: Practices and Patterns, by Paul Clements and Linda Northrop**. A comprehensive technical book on the software engineering practices and case studies related to software product line engineering.
- **Generative Programming, by Krzysztof Czarnecki and Ulrich Eisenecker**. Thorough coverage of the technical topics on building application generators, one technique for engineering a software product line.
- **Design and Use of Software Architectures: Adopting and Evolving a Product Line Approach, by Jan Bosch**. This book has two parts, the first focusing on software architecture and the second on software product lines.