

# AUTOSAR<sup>TH</sup>

ANNIVERSARY 2003-2023



**Jennifer Neumüller**  
AUTOSAR GbR



**Tony Schmidt**  
HOOD GmbH

Tagging 

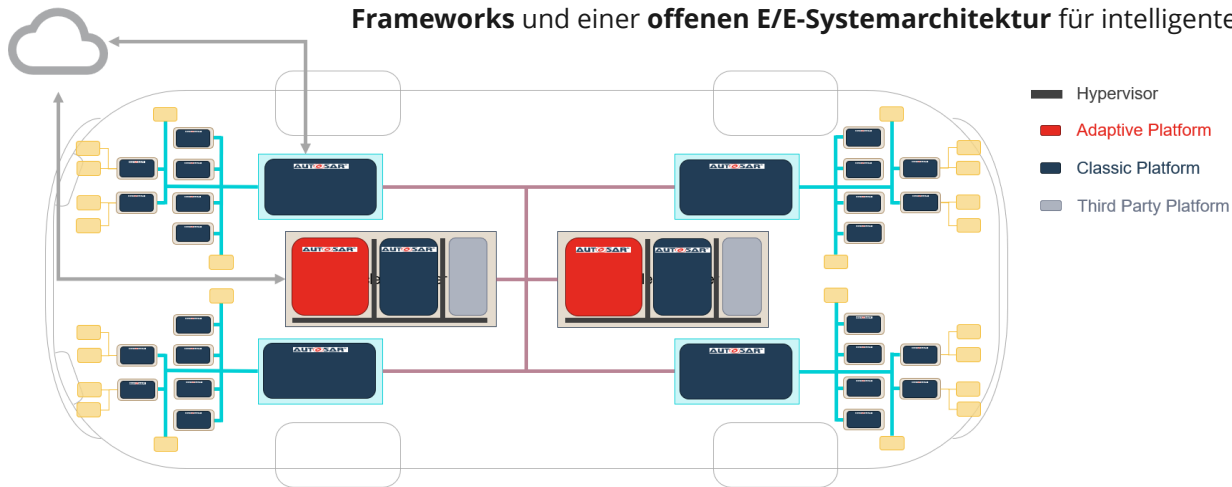
ein visueller Ansatz im  
Anforderungsmanagement



# Was ist AUTOSAR?

**AUTOSAR** is a **global partnership** of leading companies in the automotive and software industry to develop and establish the **standardized software framework** and **open E/E system architecture** for intelligent mobility.

**AUTOSAR** ist eine **globale Partnerschaft** von führenden Unternehmen der Automobil- und Softwareindustrie zur Entwicklung und Etablierung eines **standardisierten Software-Frameworks** und einer **offenen E/E-Systemarchitektur** für intelligente Mobilität.



# Kooperationspartner in AUTOSAR

- AUTOSAR Standard 2003 gegründet
- Gründungsmitglieder
- Motivation: einheitlicher Standard für Automotive Betriebssystem mit Einsatz von SW-Bausteinen

## More Than 350 AUTOSAR Partners

9 Core Partners



60 Premium Partners



Premium Partner Plus

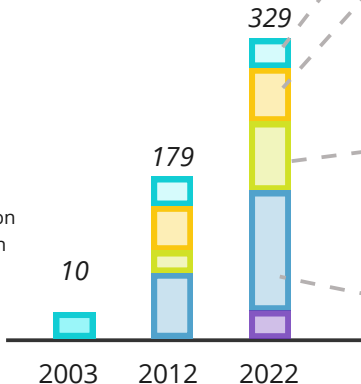


58 Development Partners



+ 146 Associate Partners  
+ 27 Attendees

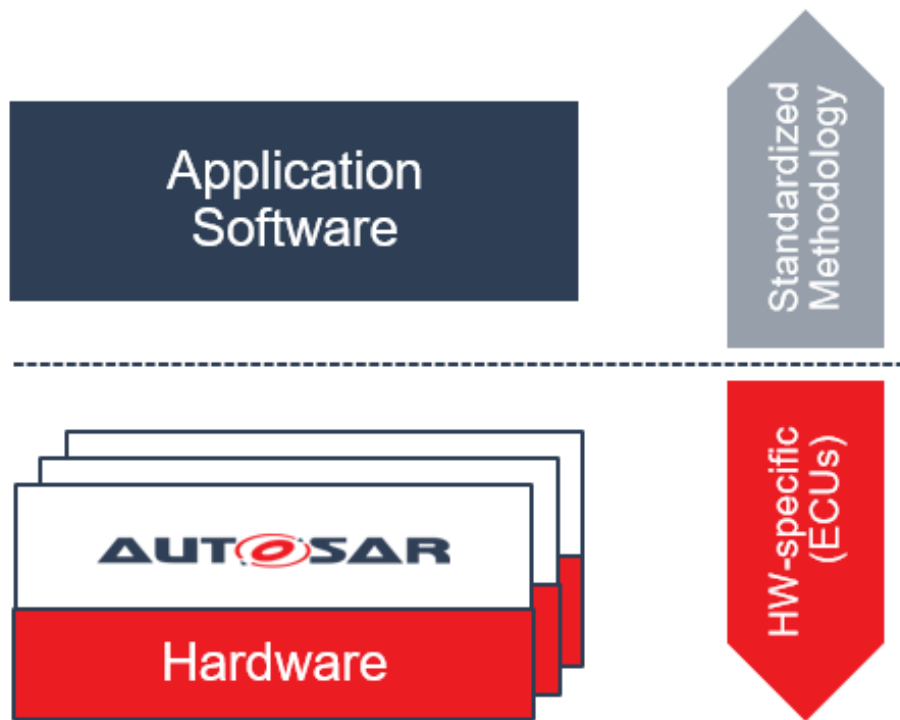
Anzahl von Partnern



# Architektur von AUTOSAR

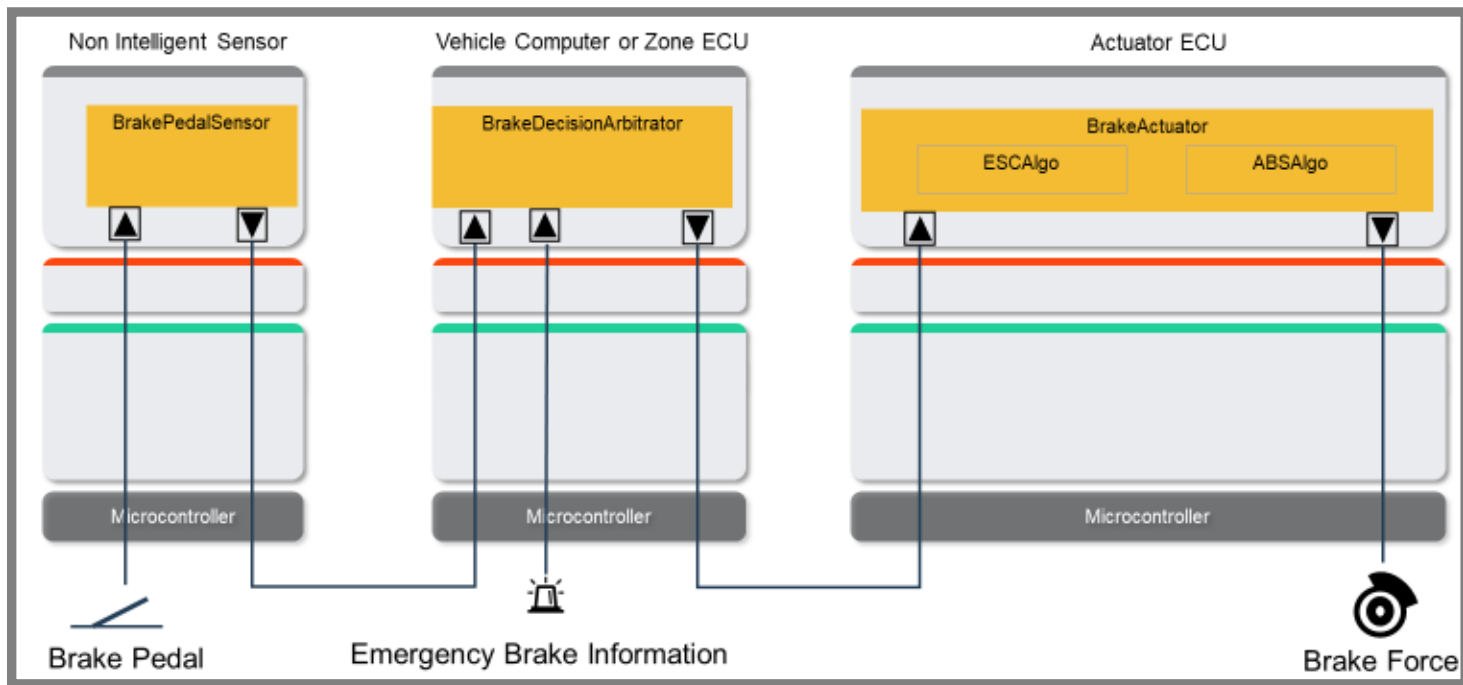
Hardwareabstraktion  
ermöglicht Entwicklung  
von wiederverwendbarer  
Software

AUTOSAR definiert  
Software Architektur in  
Layern um Hardware und  
Software zu entkoppeln

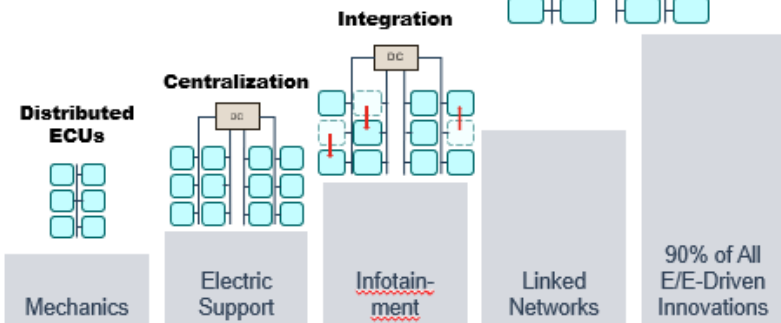




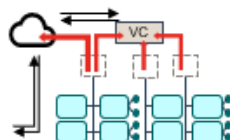
# Beispiel für eine AUTOSAR-Anwendung



# Wachsende Komplexität und Anzahl von Anforderungen



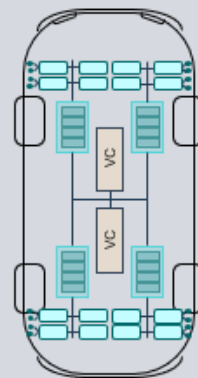
## Vehicle Computer



Major E/E-driven Innovations

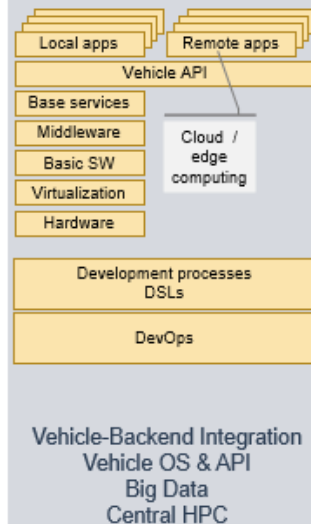
Vehicle-Backend Connection  
Service-oriented Architectures

## Zone Architecture



Zone Architecture  
Time-Sensitive Networking

## Software-Defined Vehicle

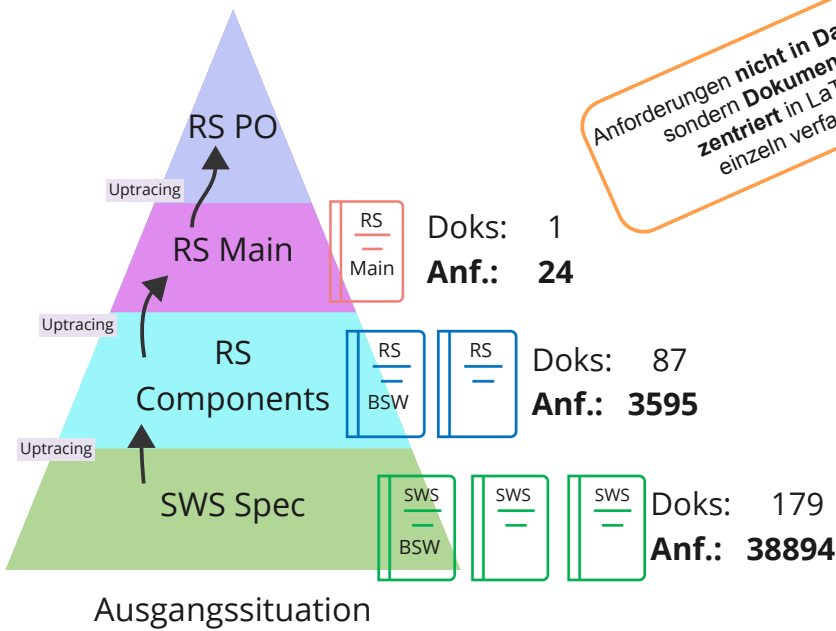


TIME



# Struktur und Abstraktionsebenen von Anforderungen

RS - Requiements Specification  
 SWS - Software Specification  
 ARXML - AUTOSAR Extensible Markup Language



Anforderungen nicht in Datenbank, sondern Dokumentenzentriert in LaTeX einzeln verfasst

Document Title	Document Owner	Document Responder	Document Identifier No.	Document Release	Document Change	Document Change
[SRS_ModeMgm_09180]	AUTOSAR	AUTOSAR	09180	2021-11-24	R02-11	AUTOSAR Release Management
[SRS_ModeMgm_09177]	AUTOSAR	AUTOSAR	09177	2021-11-25	R02-11	AUTOSAR Release Management
[SRS_ModeMgm_09172]	AUTOSAR	AUTOSAR	09172	2021-11-25	R02-11	AUTOSAR Release Management

**[SRS\_ModeMgm\_09180]** The BSW Mode Manager shall evaluate the current mode requests

**Description:** The BSW Mode Manager [1] shall arbitrate (evaluate) the current mode requests and switch the modes dependant on the result. Each OEM applies specific rules for mode changes.

**Rationale:** The resulting state is hold in a state manager like the EcuM, in the RTE [7] or in a SW-C (the BSW Mode Manager [1] is stateless)

**Use Case:** -

**Dependencies:** SRS\_ModeMgm\_09177

**Supported Material:** Covered feature request:
 

- RS\_BRF\_00103 (The enabling of IPDU groups shall be done by calling an appropriate interface of COM)
- RS\_BRF\_00060 (The control of the LIN Schedule tables shall be done by calling an appropriate interface of the LIN interface)
- RS\_BRF\_00190 (Configurable BSW internal Evaluation of Mode Requests)

(RS\_BRF\_01472, RS\_BRF\_01528, RS\_BRF\_01448) **ARXML**

**[SWS\_BswM\_00252]** [When a BswMModeCondition has BswMConditionType = BSWM\_EVENT\_IS\_SET and references a BswMEventRequestPort:

- if the BswMEventRequestPort is in a SET state, then the BswMModeCondition shall evaluate to TRUE
- if the BswMEventRequestPort is in a CLEAR state, then the BswMModeCondition shall evaluate to FALSE

(SRS\_ModeMgm\_09180, RS\_ModeMgm\_09177) **ARXML**



# Problem & Ziel

## Problem:

- **Traceability** über mehrere Ebenen gestaltet sich schwierig  
-> kontinuierl. Konsistenzsicherung im AUTOSAR-Umfeld erwies sich unrealistisch
- **Navigationschwierigkeiten**
- **Abhängigkeiten** zwischen Anforderungen auf der **gleichen Ebene schwer** darstellbar

## Ansatz:

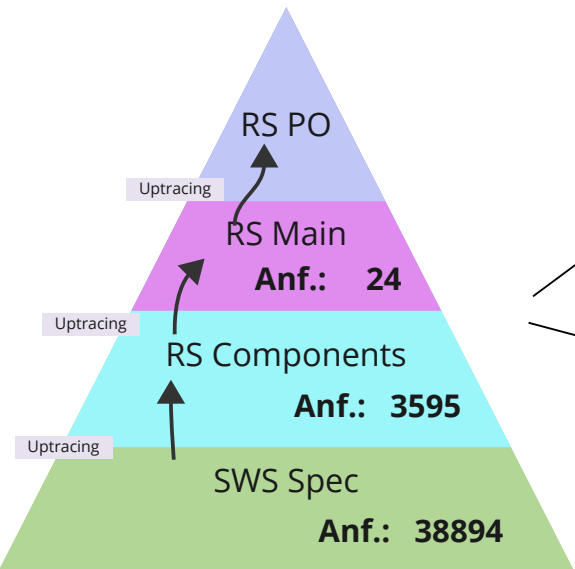
- Verstichwortung von Spec-Items  
-> Tagging

## Ziel:

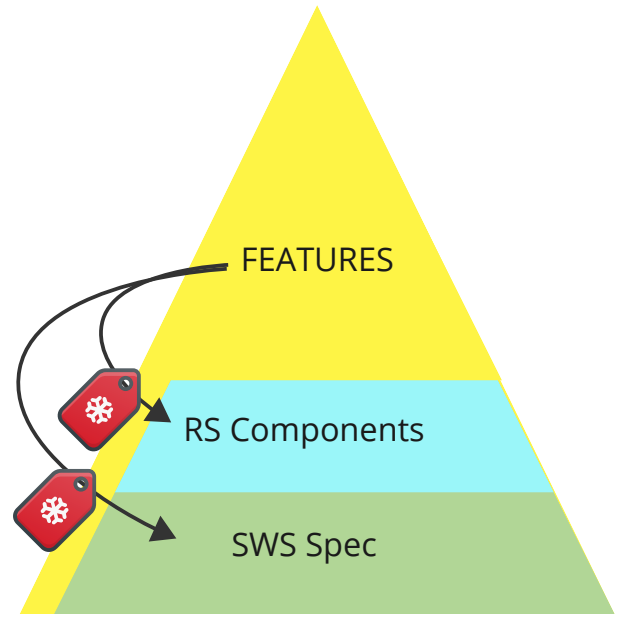
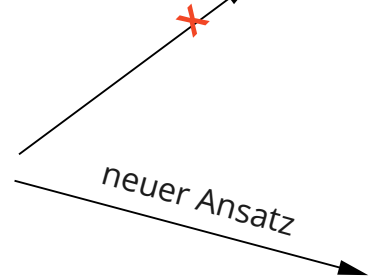
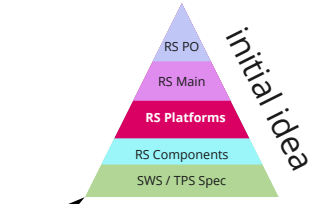
- Einfache Auswahl von Subsets aus den Autosar Dokumenten
- Darstellung von Abhängigkeiten zwischen Dokumenten
- Darstellung implementierter Features über mehrere Dokumente des Standards hinweg



# Neuer Ansatz



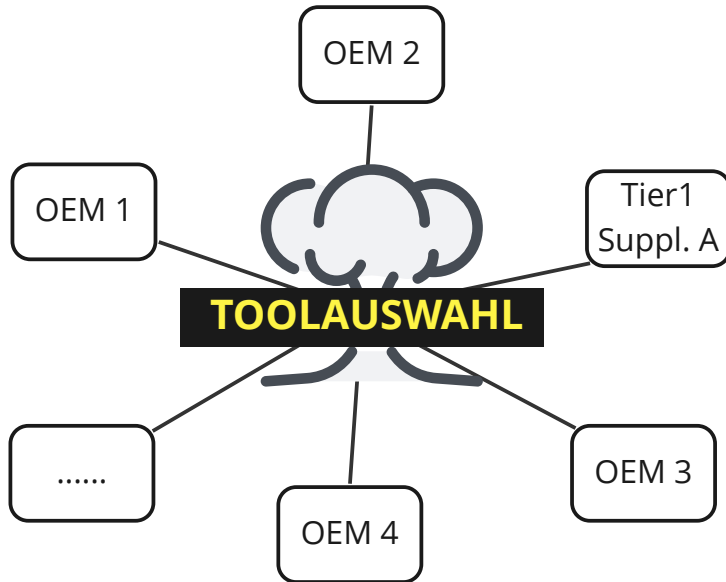
Ausgangssituation



Features auf weitere Ebene taggen



# Auswahl Taggingtool



## Anforderungen an Tool:

- Lizenzkosten
- einfach zu bedienen
- Import & Export von ARXML-Files







Freeplane

Version 1.10.6 | Rang 4 / 118

### Kriterien an das Tool:

- Daten importieren (als ARXML)
- Daten mit Tag versehen
- Daten exportieren (als ARXML)

The screenshot shows the Freeplane mind map interface. The central node is 'AUTOSAR Standard' (highlighted in a blue oval). It branches into 'RS\_Anforderungen' and 'SWS\_Spezifikationen'. 'RS\_Anforderungen' further branches into 'RS\_Doc\_1', 'RS\_Doc\_2', and 'RS\_Doc\_3', which are linked to 'Req\_1', 'Req\_4', 'Req\_2', 'Req\_4', and 'Req\_5' respectively. 'SWS\_Spezifikationen' branches into 'SWS\_Doc\_1' and 'SWS', which are linked to 'Spec\_3' and 'Spec\_4' respectively. A smaller inset window shows a zoomed-in view of the 'AUTOSAR Standard' node. A large green box with the text 'Live Demo' is overlaid on the center of the mind map. The software interface includes a menu bar with function keys (F1-F12), a toolbar, and a status bar at the bottom showing 'Created: Jan 11, 2021' and 'Modified: Apr 14, 2023'.



# AUT20<sup>TH</sup>SAR

ANNIVERSARY 2003-2023



**Jennifer Neumüller**  
AUTOSAR GbR



**Tony Schmidt**  
HOOD GmbH

Tagging 

**Vielen Dank für die  
Aufmerksamkeit**

**Wir sind offen für Fragen**

