

**Embedded Software Development with AUTOSAR  
based on « Model-Based Design » process**  
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# Summary

- PSA Peugeot Citroën
- SEPH Entity
- EPS development process
- Conclusion and roadmap

C4 CACTUS



New 308



DS 5LS



# PSA Peugeot Citroën: Facts and Figures

Europe's

2nd

largest carmaker



€54.1

billion in revenue



2,819,000

units sold in 2013

No.1 patent filer

in France for the past  
six years

Operations in

160

countries



14,500

people are involved in global  
R&D each day

# SEPH Entity

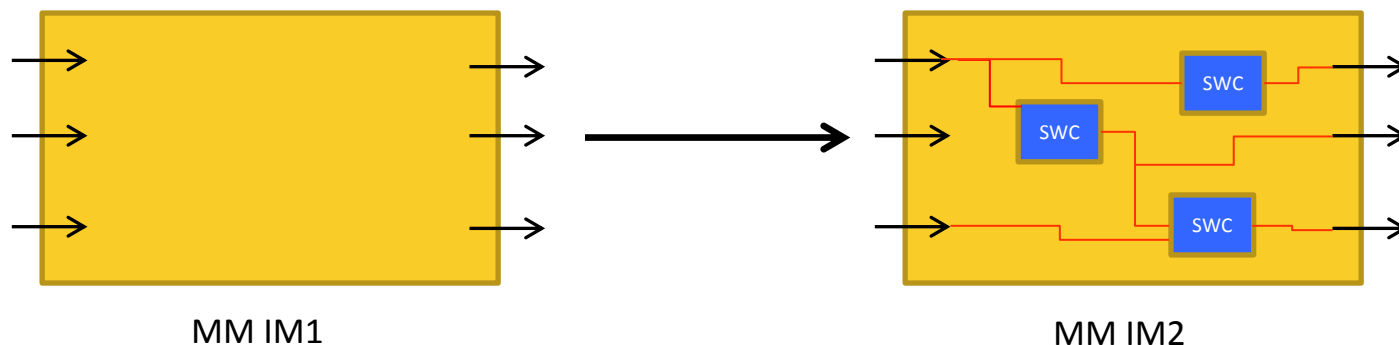
- SEPH = Software Engineering Powertrain & Hybrid
- Development and verification of applicative embedded software for engines controls according to AUTOSAR standard
- Manager: Mr. Michel ROUX
- 1 team per engine type: Gasoline, Diesel, Hybrid/STT
- 1 transversal team: Quality & Method/Toolchain



# SEPH Service: Deliveries

## The Macro Module

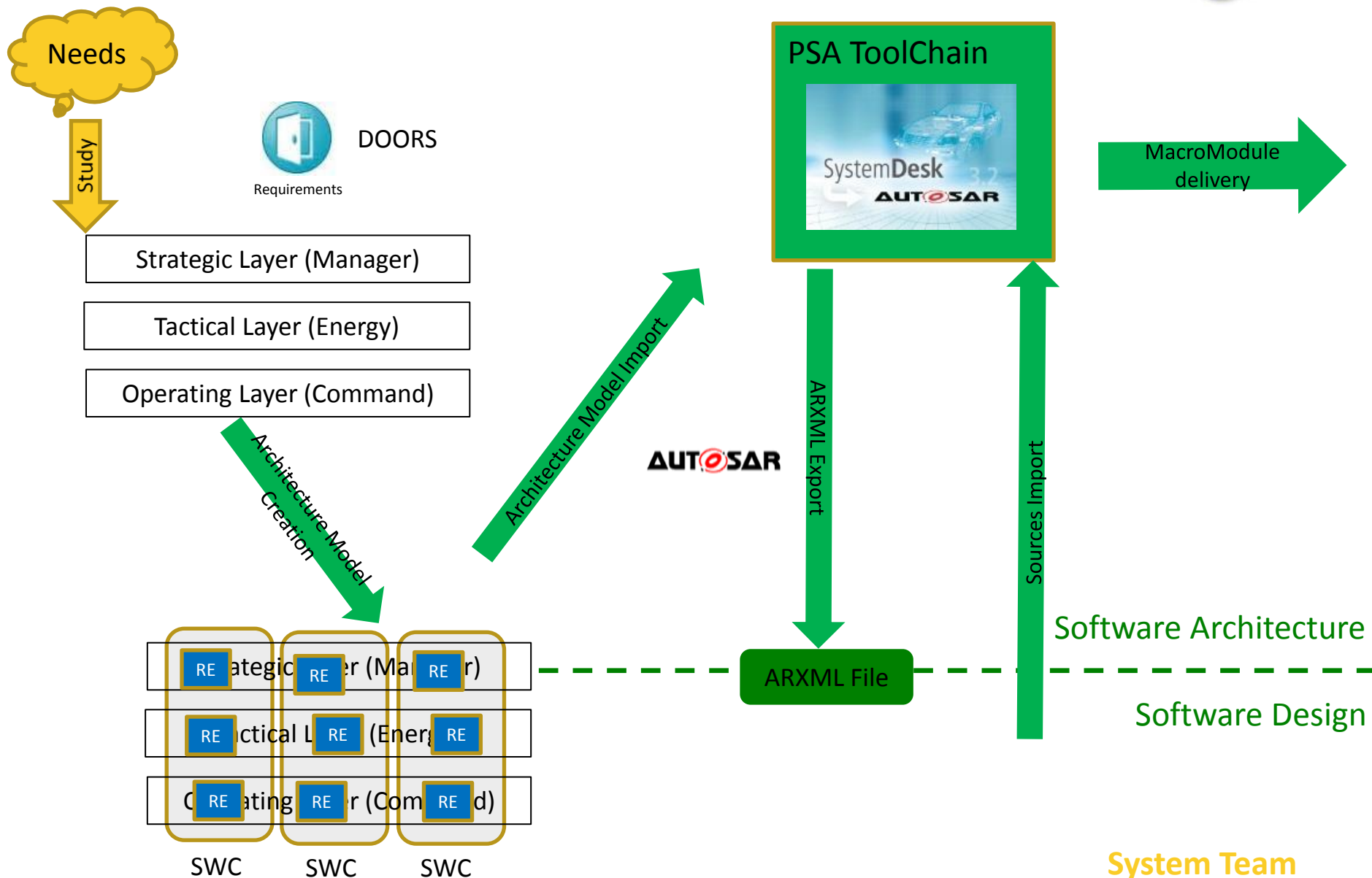
- 90% of applicative software
- 1 AUTOSAR composition, several Software Components
- Based on AUTOSAR release 3.1
- Two delivery milestones to Tier1 (function integrators)



## Key figures

- 6 Macro Modules (3 Diesel, 2 Gasoline, 1 Hybrid)
- 1 MM delivery (milestone 2) per quarter
- 1500 external interfaces + 1500 internal interfaces
- More than 80 SWCs + 7 librairies
- 2,6 MB of ROM, 42 KB of RAM

# EPS development process: Software Architecture



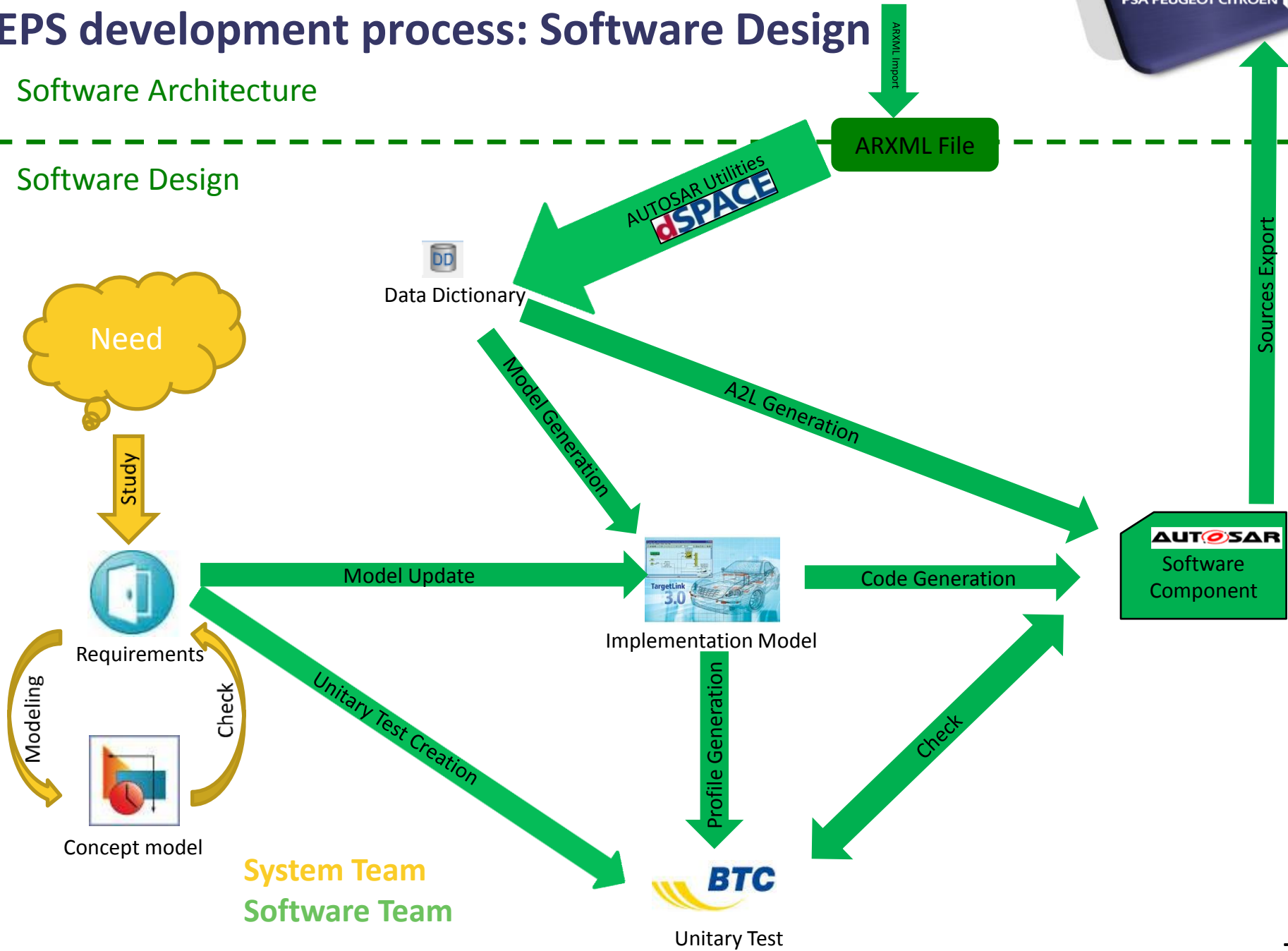
**System Team**

**Software Team**

# EPS development process: Software Design

Software Architecture

Software Design





# Conclusion: Process benefits

- Requirements Traceability (forward et backward)
- Requirements check (ISO26262 relevant)
- Respect of standard AUTOSAR
- Software design constraints taken into account
- Design directly with TargetLink
- Reduced development cost





# SEPH Perspectives

- **Migration to AUTOSAR Release 4.x in 2015**
- **Usage of ECU Extract**
- **Facilitate Multi-Core allocation**
- **Validation of MacroModule in addition to unit testing of SW-Cs**
- **Formal Methods**

# Thank you for your attention!

# Questions?



**PEUGEOT**  
MOTION & EMOTION



**CITROËN**

