

# CompEAS

## Enabling Dynamic Composition in Embedded Automotive Systems of the Future



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### MOTIVATION & GOALS

1. **Long-term Maintenance** of Basic Software (BSW)
  - **Portability and verification** of low-level software (operating systems, drivers, etc.)
2. Generic Support for **Non-Functional Requirements (NFR)**
  - **Management** of changing application requirements (timing, energy, etc.)
3. **Compositional Application Software (ASW)**
  - **Automatic integration** of modular software (e.g., during updates)

#### Project FactBox

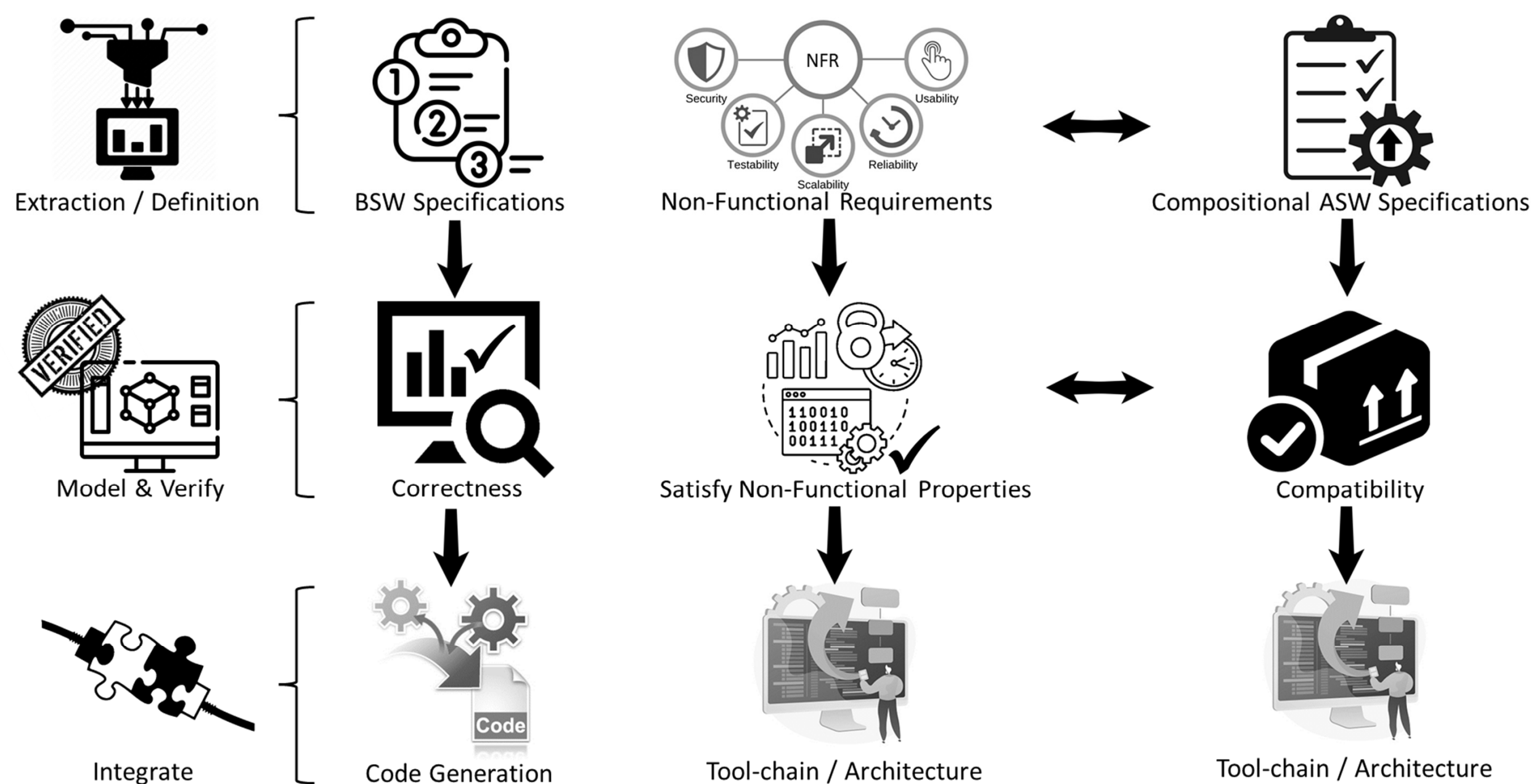
**Project Name** CompEAS  
**Project ID** MFP II 4.1.2.1-2  
**Duration** 53 Months

**Area 4.1**  
Cognitive Products

**Project Lead**  
Prof. Dr. Marcel Baunach  
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### APPROACH



### CONTRIBUTION

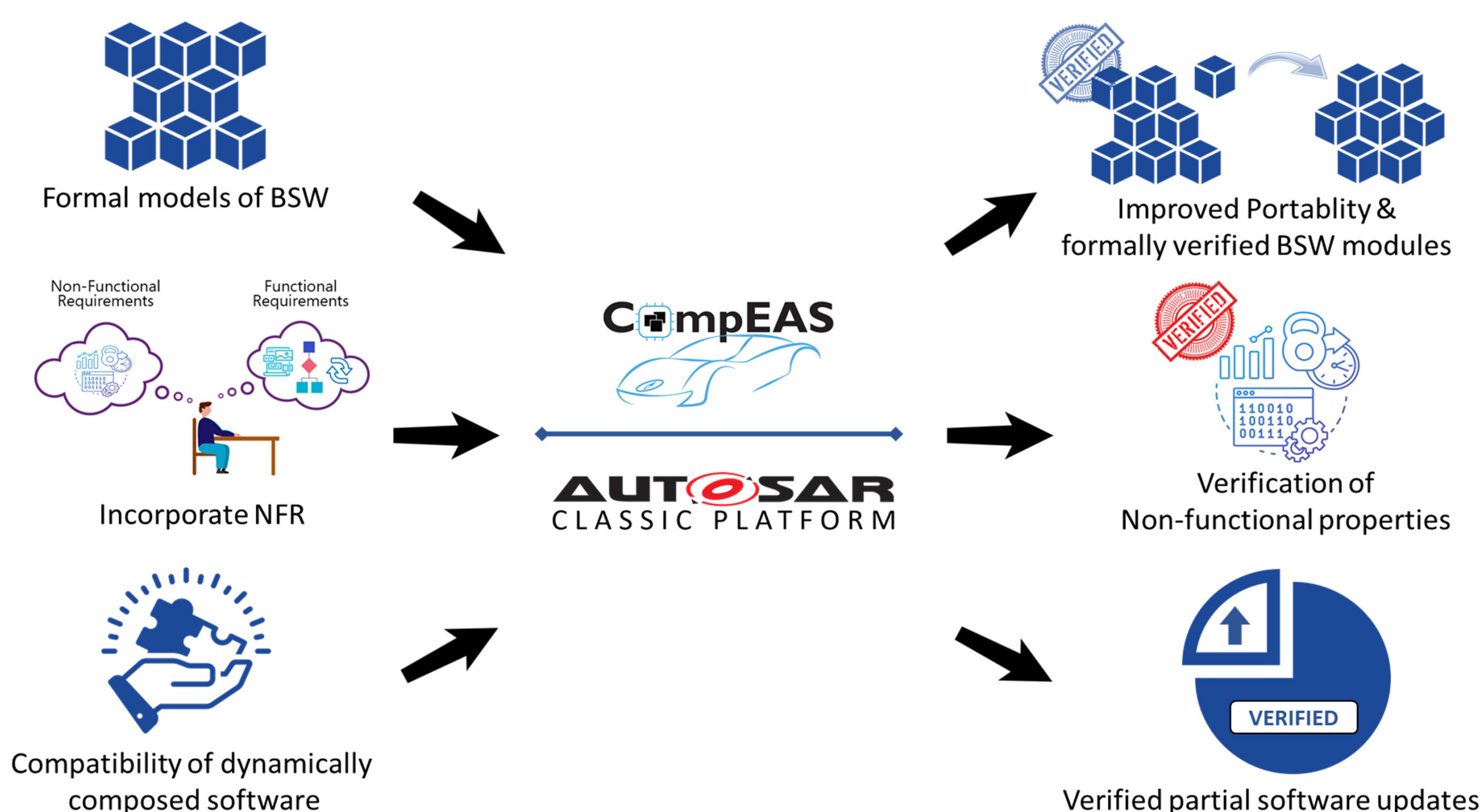
#### Scientific contribution

Bring new and innovative technical concepts into embedded automotive systems, focusing on verification, long-term operation, and maintenance of Classic and Adaptive AUTOSAR environments.

#### Economic contribution

The conventional EAS development approaches validate the software functionally and rely on costly bug fixes at later stages. The research aims on improving reliability and maintainability of the software by focusing on correctness by construction and incorporating non-functional requirements.

### OUTCOME



### KEY HIGHLIGHTS

- Transform conventional automotive software development into a **generative** approach
- Formal specification of **non-functional requirements**
- **Modelling** of low-level hardware aspects for software **verification**
- Transform **validated or tested** software into **verified** software using formal methods
- **Migrate from monolithic** software updates to **partial** software updates in the field
- Automatic **compatibility** checks through formal methods **before** deployment

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