



FH Salzburg

# Towards a Cross-Domain Modeling Approach in System-of-Systems Architectures

University of Applied Sciences Salzburg

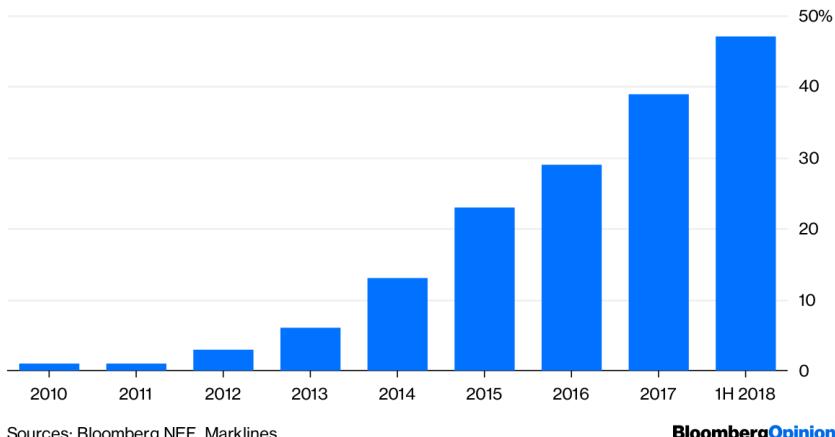
Boris Brankovic  
Christoph Binder

Technology  
Health  
Media

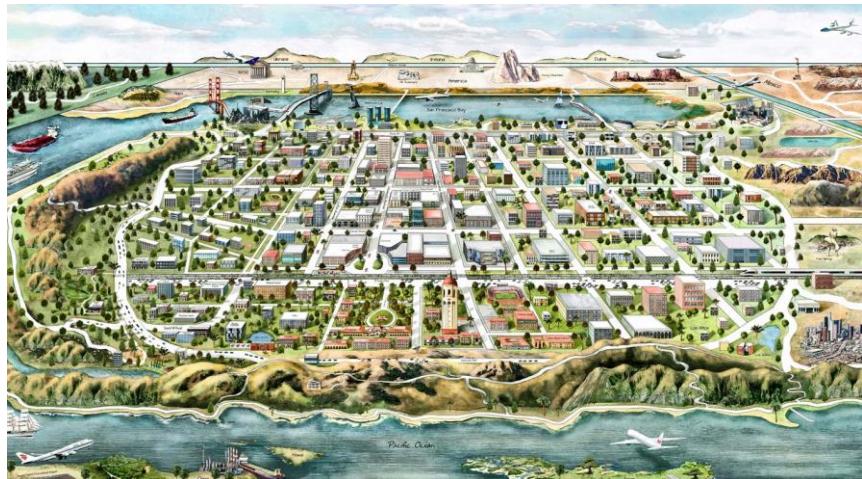
# Smart Grid: Increasing Complexity



Electric vehicle sales as a percent of total vehicle sales



Sources: Bloomberg NEF, Marklines

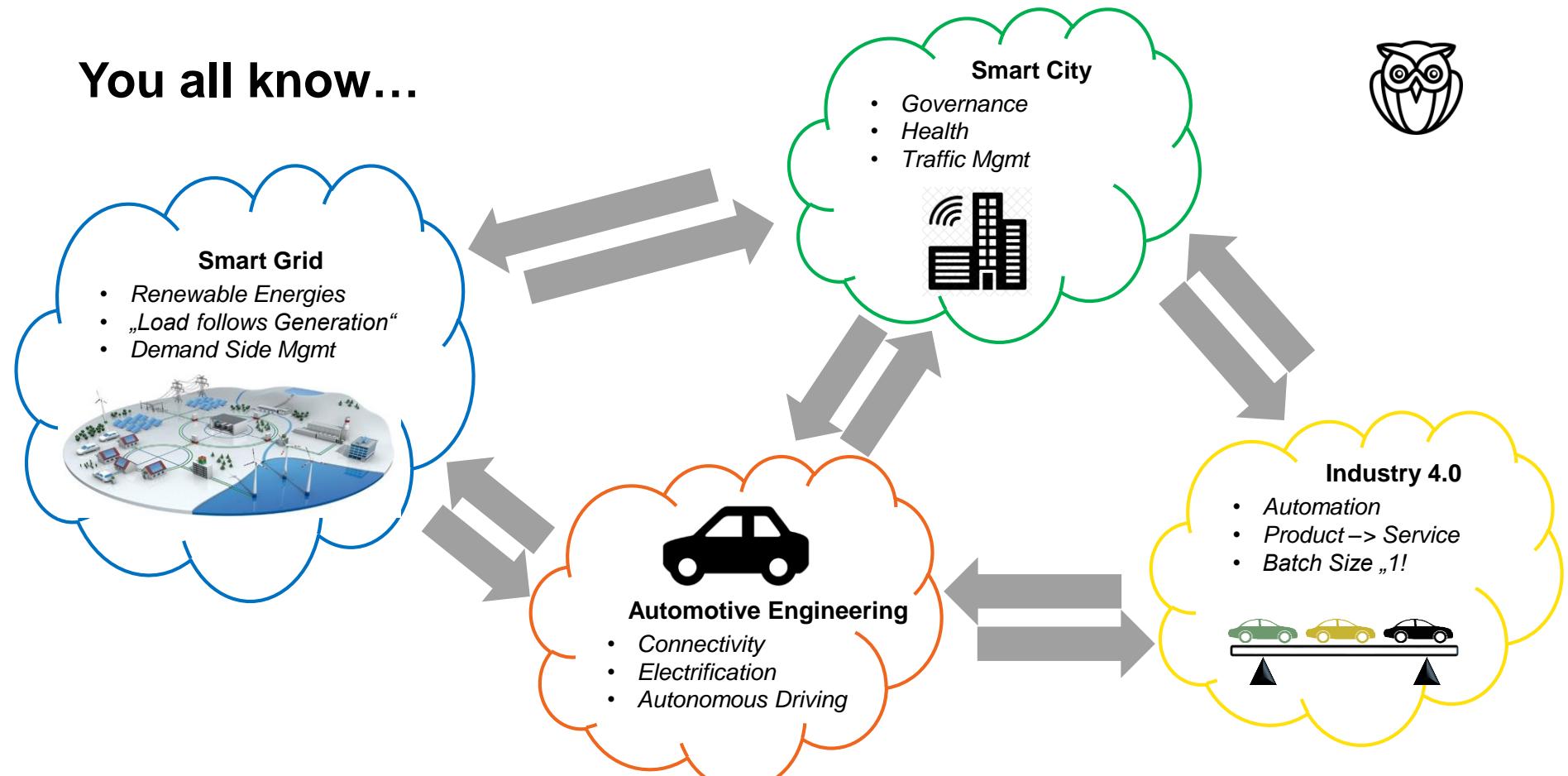


Source: <https://www.paloaltochamber.com/visitors-center>

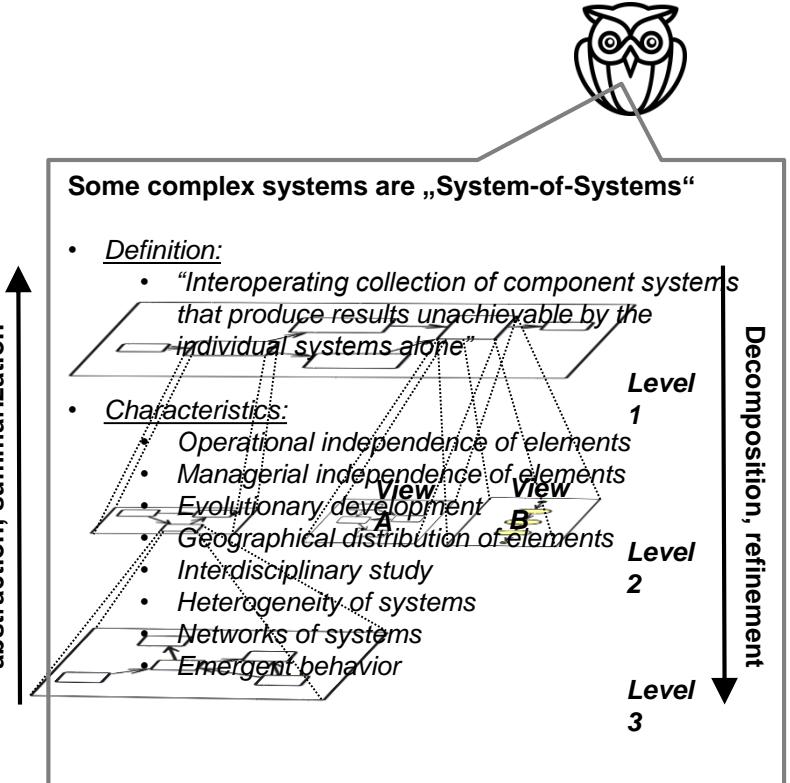
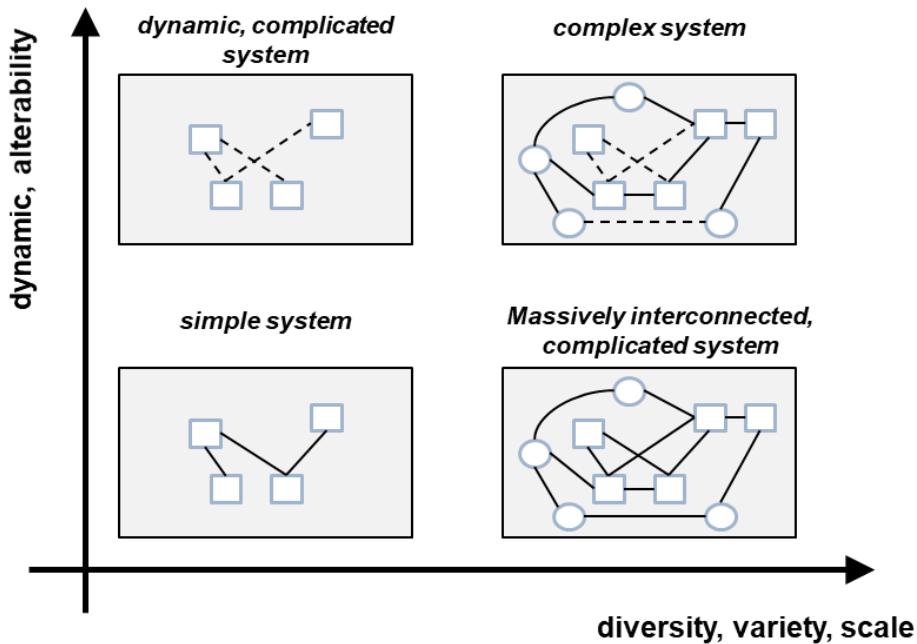
## Norway

## Silicon Valley?

# You all know...



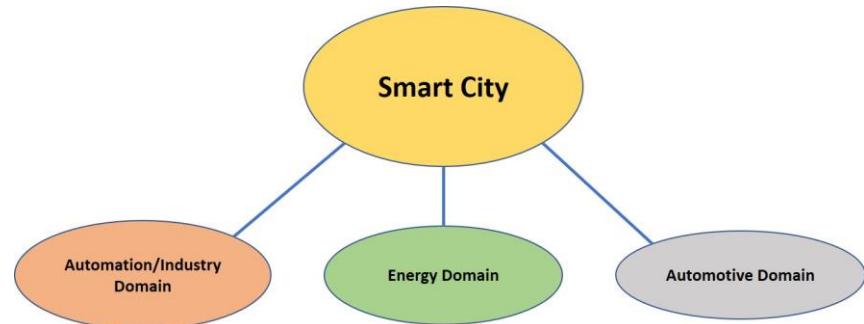
# Complex Systems





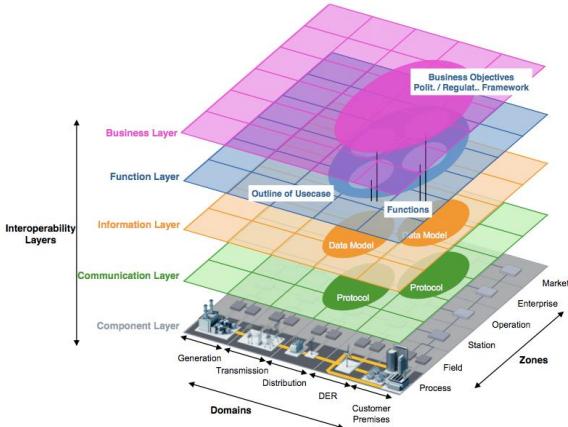
# Current Situation

- **Various Modeling Frameworks**
  - Energy Domain
  - Industry Domain
  - Automotive Domain
- **Growing Complexity**
  - Multi-Domain environment
  - System-Modeling becomes a challenging task

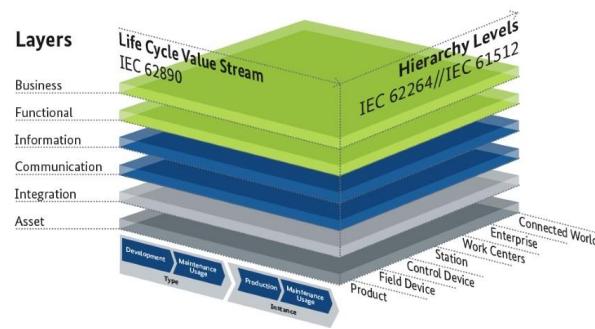




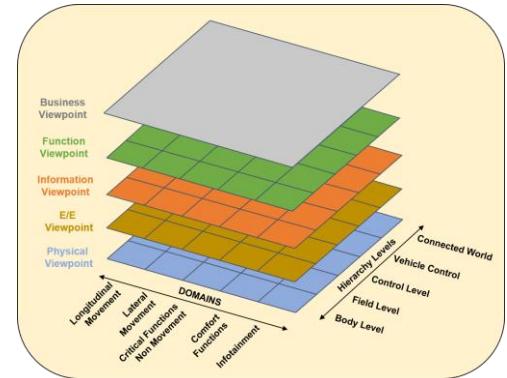
# Considered Modeling Frameworks



Smart Grid Architecture Model  
(SGAM)



Reference Architecture Model  
Industrie 4.0  
(RAMI 4.0)

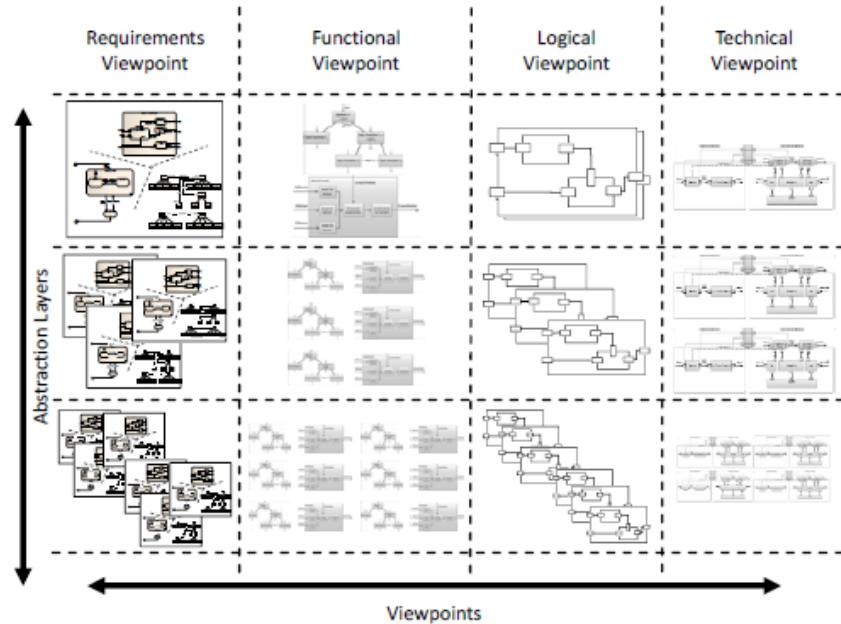


Automotive Reference  
Architecture Model  
(ARAM)

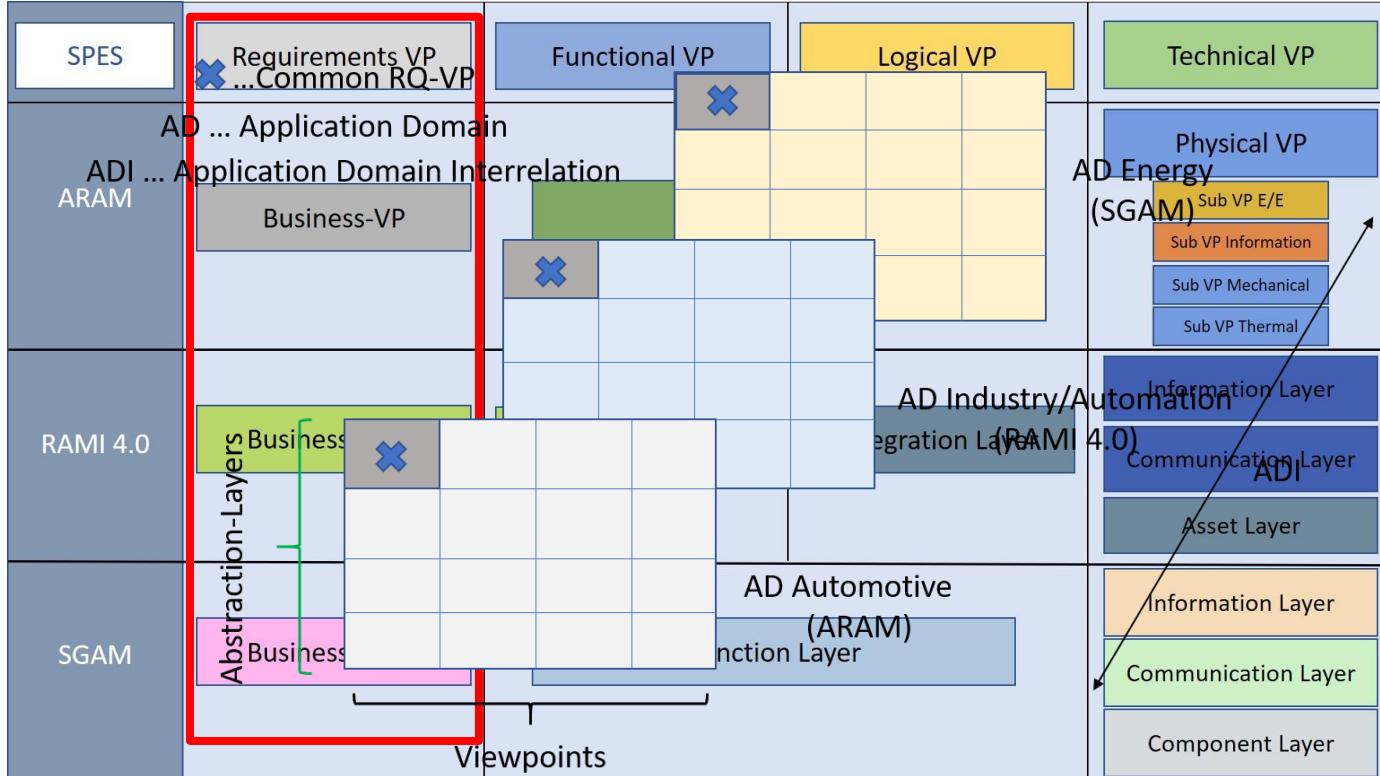
# SPES-Framework



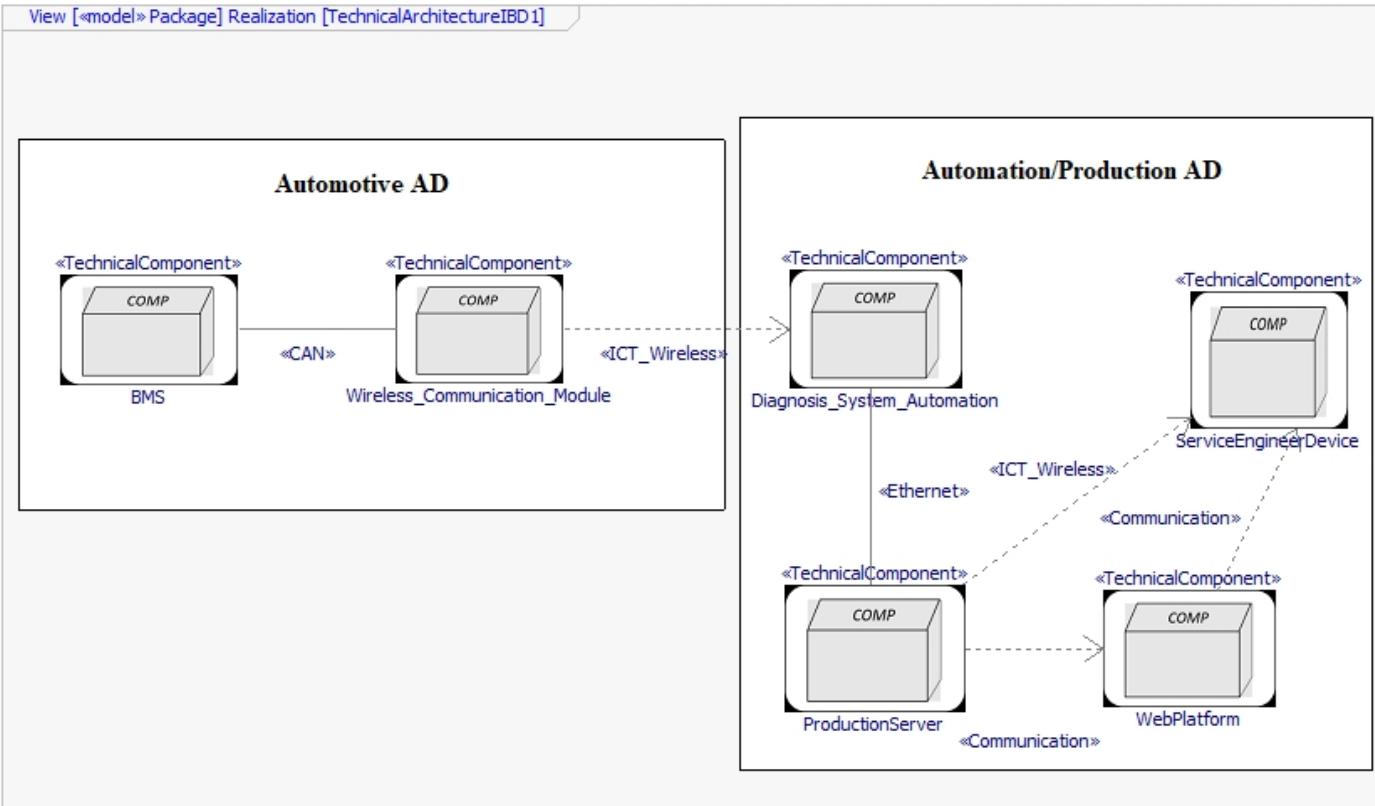
- Generic Architecture Framework
  - Software Platform Embedded Systems (SPES)
  - Used for domain-independent modeling
  - Provides Viewpoints and Abstraction Layers



# Results – Domain-Specific Framework Mapping



# Evaluation Results – Case Study



# State, Outcomes & Findings so far



- State
  - Viewpoint Mapping of considered Frameworks
  - Process-Model for Evaluation of Model-Kinds
    - Model-Kind Mapping of considered Frameworks
- Findings so far
  - Common Ground between the Frameworks SGAM, RAMI 4.0 and ARAM
  - Approach for Cross-Domain Modeling
  - Case-Study with the focus on the Automotive, Energy and Industry Domain
- Current / Future work
  - Investigation on defined Diagrams for Modeling
    - Evaluation by Domain Experts
  - Further Research towards a domain-independent Framework
- Further information
  - [www.en-trust.at](http://www.en-trust.at)
  - <https://sgam-toolbox.org/>
  - <https://rami-toolbox.org/>
    - Publications
    - Toolboxes for download
    - Tutorials