Future Plans and Steps Towards Innovation

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AMADEOS Goal

- To bring time awareness and evolution into the design of System-of-Systems (SoS),
  - to establish a sound conceptual model,
  - a generic architectural framework and
  - a design methodology, supported by some prototype tools, for the modeling, development and evolution of time-sensitive SoSes with possible emergent behaviors..
- Measures of success
  - proof-of-concept prototype on a smart GRID application,
  - training and background material

AMADEOS current achievements

- Established a solid conceptual model for SoS through viewpoints
- Semi-formalization in SysML
  - AMADEOS profile definition
- Preliminary definition of an architectural framework that captures all the relevant aspects of evolvable SoS
- Identification of a Case Study on Smart Grid

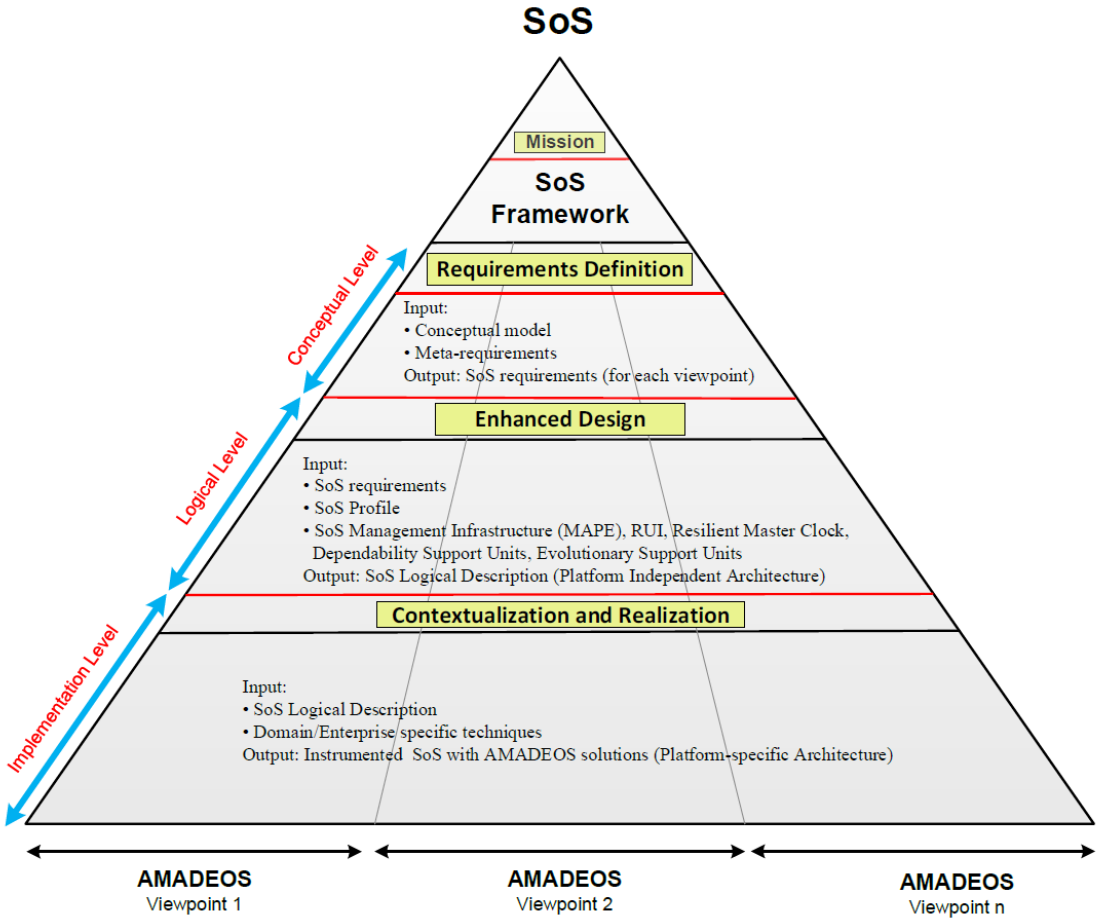
AMADEOS next steps

- Support SoS design(ers)
  - Completion of the AMADEOS SysML profile and its integration in open MDE frameworks
- Enhancement of SoS Architectural Framework
  - Including monitoring, cognitive and predictive features
  - Development of the components of the Architecture such as a **Resilient Master Clock**
- Development of the Grid Case Study
- Tutorial book and course material

Support SoS design(ers)

- Completion of the of AMADEOS SYSML profile for SoS conveying key SoS concepts
  - Time-awareness
  - Evolution
  - Dynamicity
  - Emergent properties
  - Multi-criticality
- Integration in MDE frameworks
  - Adaptation of a user-friendly graphical editor based on the profile able support design, e.g. check the interface compatibility between couples of constituent systems.
  - Providing guidelines to ease the design specification

Architectural Framework



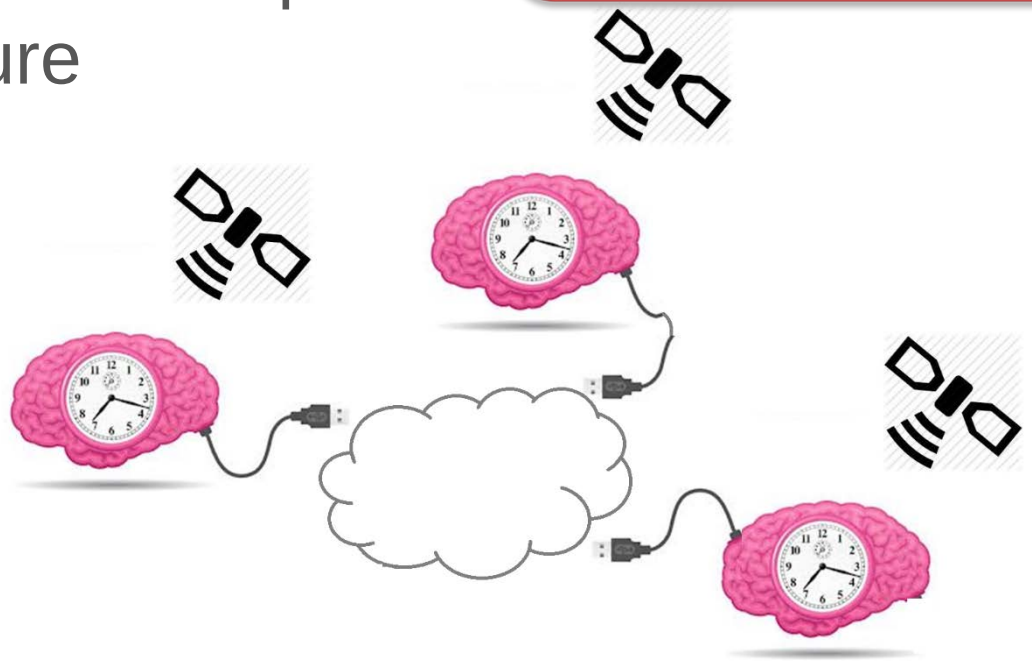
Building blocks

- SoS Management Infrastructure
  - The MAPE (monitor analyse plan execute) blocks
- Relied Upon Interfaces
- Time Awareness
  - Resilient Master Clock
- Dependability and security aspects
- Evolutionary aspects

Resilient Master Clock

- Development of the Resilient Master Clock
- Let's put concepts, model and guidelines into practice!
  - Hardware proof-of-concept prototype for future low-cost mass production

Time-awareness, evolution, emergence, dynamicity, security



Tutorial book and course material

- Preparation of teaching material for an SoS Engineering advanced (M.Sc./Ph.D.) course, which includes:
  - AMADEOS SoS concepts
  - SoS model
  - SoS design principles and guidelines
  - SoS SYSML profile
- Realization of a reference tutorial book

Steps towards Innovation

- Knowledge innovation
  - SoS concepts and model
- Process innovation
  - SoS design guidelines
  - SoS design supporting facilities and tools
- Proof-of-concept on key issues (time-awareness, dynamicity and emergence
  - Prototype development

Steps Towards Innovation