

# ITEA Smart Systems Engineering workshop

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ITEA 4 is the Eureka Cluster on software innovation



Closing

**ITEA Smart Systems  
Engineering  
workshop**

# ITEA Smart Systems Engineering workshop

## Reminder of the goal

The aim of this workshop is to bring together researchers, (future) project leaders and developers from several disciplines to share their experiences and discuss the latest advances and innovations in Smart Systems Engineering with application to the development of smart systems.

The overall objectives of the workshop will be:

- To increase the understanding of problems of Smart Systems Engineering
- To benefit from the experience of ITEA projects
- To identify important challenges that could lead to new research projects

Thank you  
Highly appreciated support

Panellists

The organisation committee of the ITEA Smart Systems Engineering workshop:



Participants



# ITEA Smart Systems Engineering workshop

## What we have learnt

# Complexity of applications

## Some findings

- Challenges for the systems we want to design
  - Functionnal : computing capacity, latency network , energy constraints, heterogenous systems
  - Non-functional: energy efficiency, ethics, security easiness of operation
- Potential directions
  - Tool to design addressing an ecosystem
  - Education to understand the complexity
  - Interdisciplinarity: not only computer science but engineering, human behaviors
  - Decomposition methods
  - Distributed computing, control, debug
  - Abstraction, transition between different level of abstraction, support of the engineering process, collaboration tools
  - Energy efficiency for AI applications
  - Credible Simulation Process: traceability and reuse
  - Better integration of physic models inside AI methods
  - Real time digital twin

# Standardisation

## Some findings (1/2)

- Challenges
  - Still some functionalities to add in current standards to reach the objective of full digitalized system manufacturing
  - Hybrid engineering ask for new semantic oriented tools
  - Hardware-software co-design : multi domain, multi language, multi standard
- Hot topics
  - AI semantic standardization
  - Combination of models (digital twins) and related standards for hybrid engineering; ontologies for meta-concept representation
  - Multi parties understanding of quality
  - Imagine semantic interoperability based on a flexible communication standard ontology
  - Create a vision of the ongoing effort on standardization (dashboard of initiatives);
  - Open access to the ongoing standard works and more open standard ecosystem (free of charge access)
  - Standard for the data used in AI methods
  - Vision of automatization of the standard design
  - Digital twin standardization
  - New business model: participant should get benefit

# Standardisation

## Some findings (2/2)

- Approach to be successful
  - Sometimes you need 2 projects (a long journey): one for the emergence and one for the adoption (in some cases: 10 years)
  - Need of partners that are already involved in standardization bodies
  - Creation of an ecosystem
  - Not a unique complex standard but some complementary standards that can be combined
  - Step by step approach: what to model, how to model, how to integrate all models
  - In addition to the standard add an open-source implementation, a test suite and a methodology
  - Setting up an organization for certification to guarantee interoperability
  - Standard activity can be fun
  - You need a lot of discussion to come to a common understanding



# AI application development / Dataops versus Devops

## Some findings

- Challenges
  - Development of a digital virtual environment of healthcare system
  - How to learn from complex systems in nature
- Potential directions
  - AI method for AI application development
  - Traceability of AI applications (how to store all the components data, learning models...)
  - Certification
  - Sharing data in the healthcare sector
  - Quality of data
  - European value integration in the application development
  - Resilience
  - Hybrid by design human in the loop
  - MLOps with integrated and automated workflows, data cleaning and versioning, monitoring them model and validation
  - Deployment to the edge
  - Selecting the right method depending on the structure of the data
  - Communication between 3 dimensions: domain knowledge, artificial intelligence knowledge, simulation

# ITEA Smart Systems Engineering workshop

## Follow-ups

# ITEA Smart Systems Engineering workshop

## Part of a bigger story

- The goals of the ITEA Smart Systems Engineering workshop are to understand the actual Smart Systems Engineering challenges and to build impactful RD&I projects
- The Smart Systems Engineering project ideas and corresponding project consortia can be further defined in the ITEA project idea tool (from May/June) and during the ITEA Project Outline (PO) Preparation Days in September 2022.
- Project proposals can be submitted in the upcoming ITEA Call for projects in November 2022.
- Successful proposals will receive the ITEA 4 label in March 2023 and could be funded and start by the end of 2023/beginning of 2024.



# Other actions

## Shortly coming

- Satisfaction survey
  - Send to you after this event
  - Important for us to improve
  - Important for you
  
- Report
  - Will be announced to the participants
  - Available on ITEA 4 web site



ITEA4

<https://itea4.org>

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Thank you