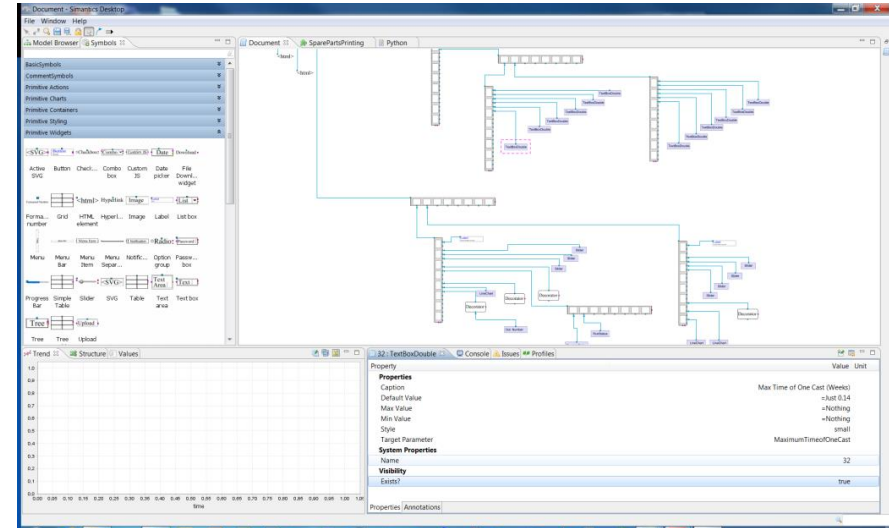


# Modeling Factory

## What is it and how to use it?

Webinar for Fraunhofer institute  
for Mechanics of Materials IWM  
2017-11-15

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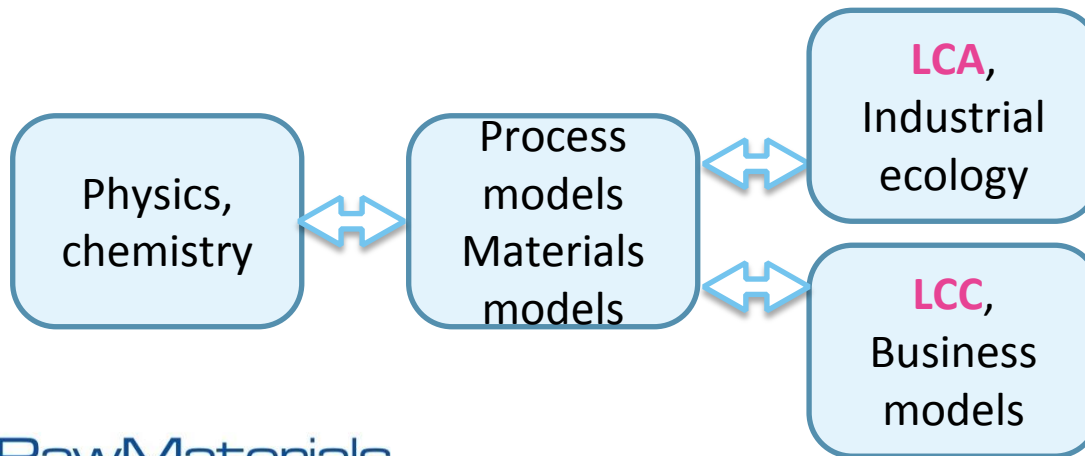


## Virtual Upscaling with Modelling Factory

- The idea of the Modelling Factory is to create a virtual working space, where individuals and organisations can test and share their ideas on how to advance material efficiency and circular economy by creating different types of computational models and solutions and to validate them against real provided scientific, industrial and environmental data.
- In the virtual upscaling project we will tackle real life upscaling challenges collected from the different KIC partners
- The methods, tools and interfaces will be made available through Modelling Factory.
- Modelling Factory acts as both a dissemination channel of the results and a virtual work room where the results are produced

## Multi-disciplinary collaboration and improved design decisions via Modelling Factory platform

- Improving collaboration between domain experts in different fields.
- Three types of users
- Developers (Information infrastructure coding)
- Modelers (domain experts, computational models)
- End-users/ Decision-makers (product designers, strategic designers, executives, teachers)
- Dissemination: data, models, GUIs (user interfaces of models)



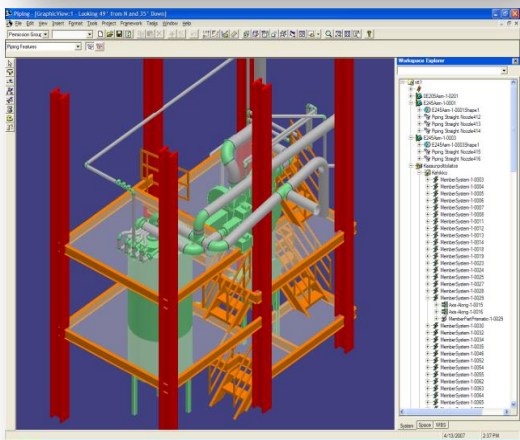
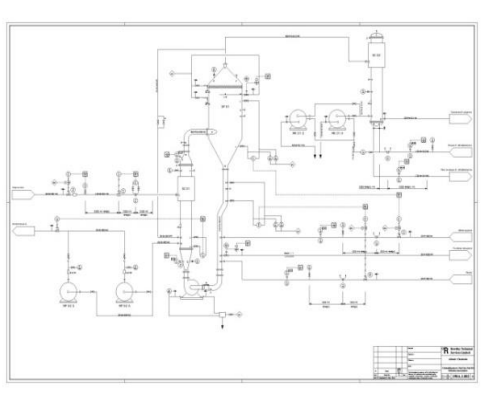
# Process simulation

# Simulation and process design integration

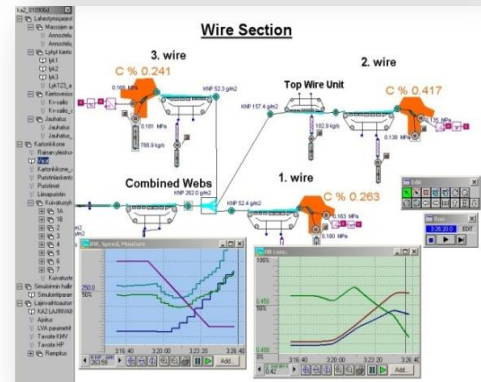
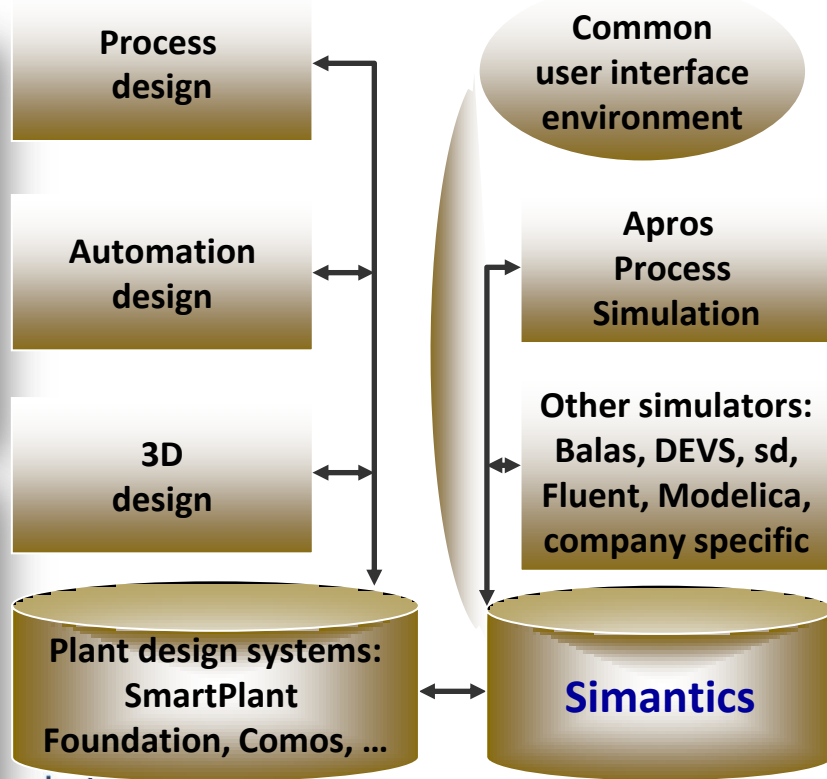


**Design Engineers**

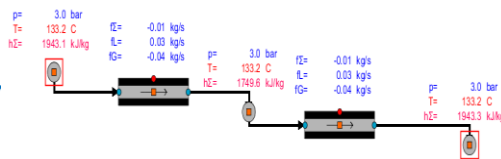
**Simulation Engineers**



19/11/2017



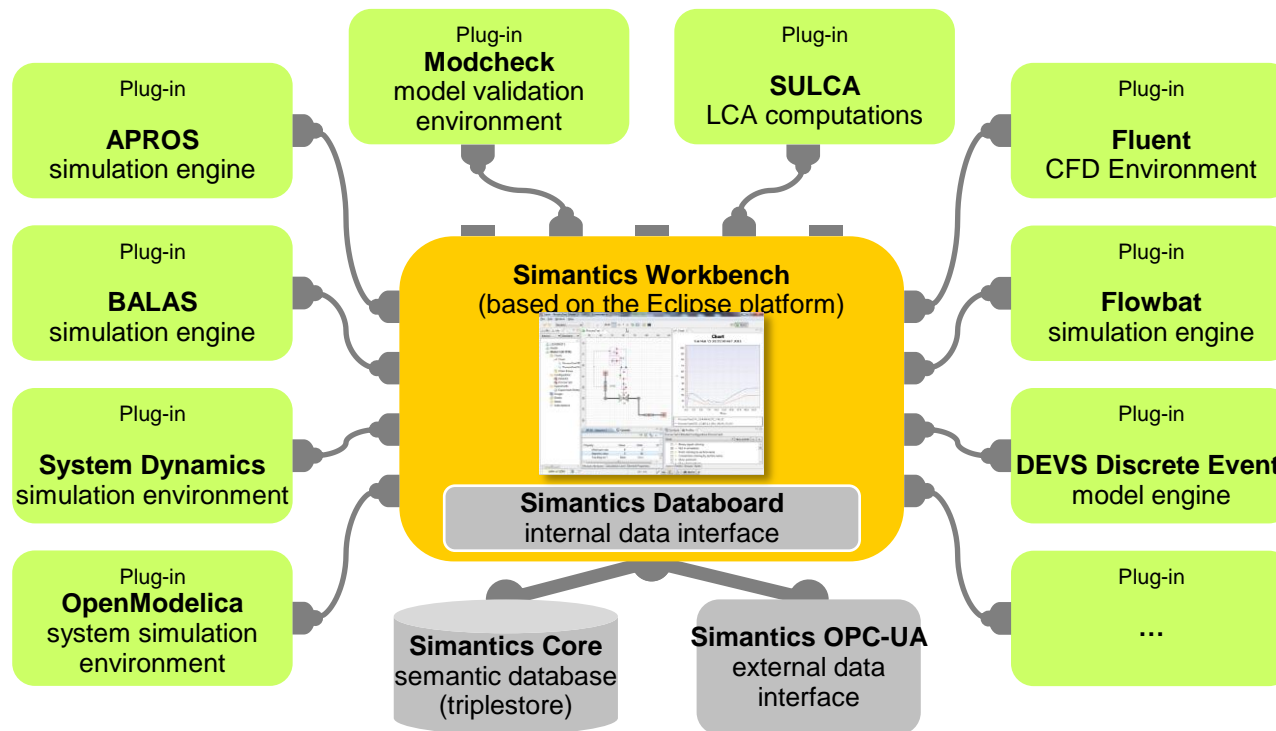
**Engineering Information Management**      **Simulation Information Management**



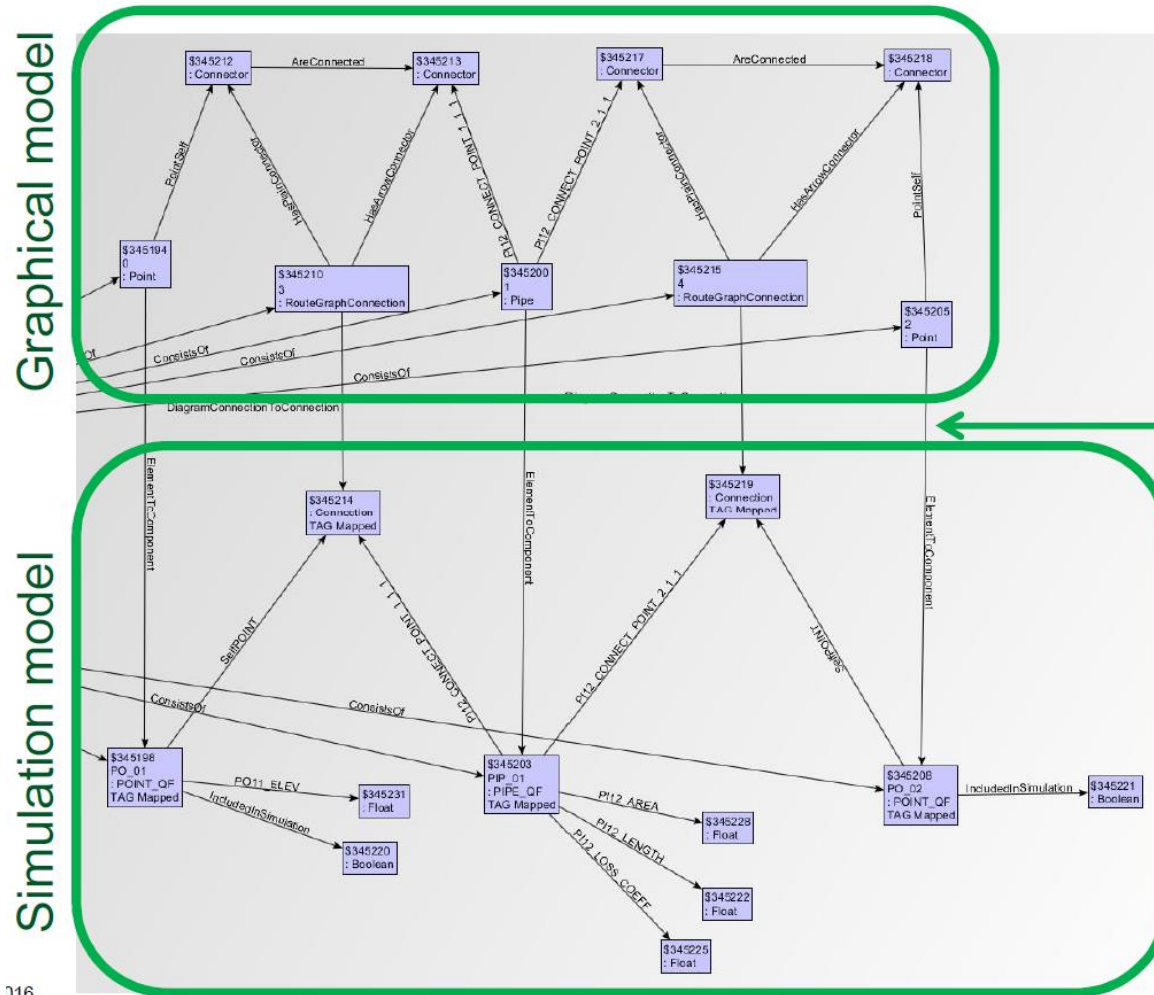
# Base technology for Modelling Factory

- The technology is based on open source Simantics platform (Eclipse)
- has been published as an open source software and maintained through non-profit association
- has development consortium of 13 member companies that pay annual maintenance budget of about 60k€
- has annual development project portfolio of about 1M€
- about 200 registered individual users
- MF's open source system dynamic modelling tool that has over 5000 downloads (one of many available tools)
- is used by large automation, power and process industry companies

# Plug-in architecture for modelling and simulation



# Semantic platform



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# General points

- Semantic integration platform: rapid integrations possible, **deeper integration** levels than just data integration possible
- **Various modeling paradigms and languages** can be used together
- Allow users to use their favorite tools in data production and analysis
- Not everything should be integrated: concentrate on **model/paradigm ‘families’**
- Utilize large **open source solver libraries** (e.g. physics, engineering, chemistry)
- Interface with HPC, do not compete with specialized solutions (e.g. support work flow management, batch jobs etc, data formats etc.)
- Support **surrogate model construction** (fast to simulate, automatable). In other words, computationally heavy models are transformed into more easily compatible fast models, which are suitable for web apps, optimization (iterative usage)
- Enable **collaboration** in work rooms and **dissemination of results as web apps**



# Demo: Modelling Factory

- <https://modellingfactory.org/>
- <http://modellingfactory.simupedia.com/amdh/>  
(sample work room for metal powder 3D printing)
- Interested in trying it out yourself? Check out instructions at
- <https://modellingfactory.org/instructions>