



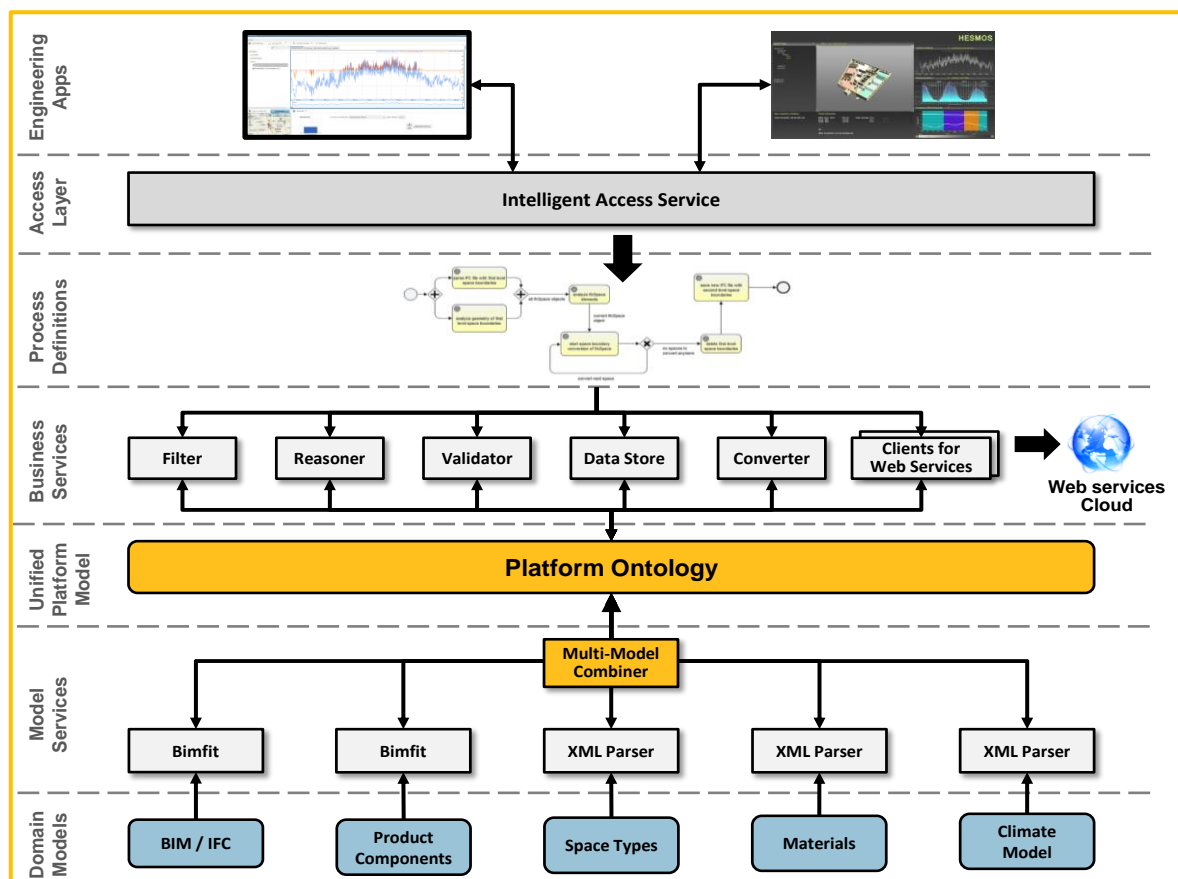
Leonhardt, Andrä und Partner (LAP) is a leading German design consultant in the area of structural engineering. Its offices in Dresden and Berlin participate in the ISES project in the role of end users. Base philosophy of all company developments is the achievement of sustainable construction. LAP and TU Dresden are authors of this newsletter.

ISES is STREP project # 288819 funded by the EU under the 7th Framework Programme. The **objective** of the project is to develop ICT building blocks to integrate, complement and empower existing tools for design and operation management to a Virtual Energy Laboratory that will allow simulation, assessment and optimisation of the energy efficiency of built facilities and facility components in variations of real life scenarios before their realisation, acknowledging the stochastic nature of the involved information resources.

In this issue, we present the ISES platform ontology binding together the multiple distributed resources required for the efficient functioning of the ISES Virtual Energy Lab and the concepts regarding sensitivity analysis, visualisation and design decision making after multiple simulations have been run in parallel on a cloud environment.

Information Backbone of the ISES Virtual Energy Lab

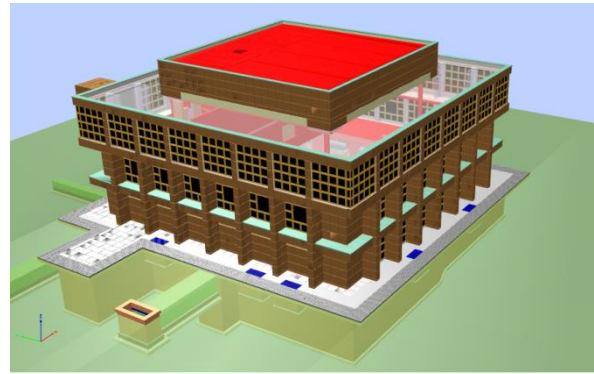
The *Virtual Energy Lab Platform (VEL)* developed by ISES enables flexible use of various information resources, services and tools targeting sophisticated cloud-based energy performance analyses and simulations in design, building component development and retrofitting. Within the scope of the project are tools for single-zone, multi-zone and full building energy simulation, sensitivity analysis, CFD analysis, requirements management, definition and management of energy resources via uniform data templates as well as post-processing, visualisation and navigation utilities for fast and well-grounded decision making. To handle that broad scope efficiently, a multi-layer multi-model approach is developed.



At the heart of the modelling infrastructure is a lean platform ontology which does not include but *links* the multiple heterogeneous resources needed for the proper functioning of the VEL together, and provides various additional reasoning capabilities such as model and value checking; model/data transformation rules and process control. Below the ontology are the different models used and the services enabling combining of the models together. Above the ontology are the tools for process and workflow management which help accomplishing the coherent use of all configured engineering VEL applications. A common intelligent access interface based on REST provides the main API of the platform and serves as basis for the developed user interfaces.

Pilot Demonstrators

Two real projects are prepared as pilot demonstrators for the ISES Virtual Energy Lab. The first is the **“Mavrica” Kindergarten in Trebnje, Slovenia**, which will be used to verify VEL performance in the energy efficient design using the advanced façade elements of the Qbiss Air System of the end-user company Trimo. The building has The usable floor area of the building is 2,698 m², and the envelope area is 6,780 m². The Kindergarten consists of 14 playrooms, administration rooms, kitchen, laundry, ironing room, and a boiler room in the basement. It offers place for about 250 children. The required annual energy use for heating of the building is 34 kWh/m². The second pilot is LAP’s design of the **“Junge Oper” building in Dresden, Germany**. It is chosen as validation scenario for the refurbishment/retrofitting process. The project is an auxiliary building of the widely known Semperoper. The building has a quadratic outline of 25m, a basement, three over ground floors and an attic. While the façade will remain mostly untouched during refurbishment, there will be far-reaching changes in the interior. In the ground floor, a lot of walls will be reduced to get a more open space for a foyer and a café. In the 2nd and 3rd floor a small stage for rehearsals and young performers will be created. To analyse the effect of the refurbishment and the change of usage, two models of the building are generated: one of the existing structure and another of the status after the refurbishment.



3D model of the “Junge Oper” building in Dresden

ISES CONSORTIUM

The ISES Consortium, enlarged in the second year, comprises four industry partners, three research organisations and three universities.

- TECHNISCHE UNIVERSITÄT DRESDEN, Germany (Coordinator)
- GRANLUND, Finland
- UNIVERZA V LJUBLJANI, Slovenia
- NYSKOPUNARMIDSTOD ISLANDS, Iceland
- SOFISTIK HELLAS, Greece
- NATIONAL OBSERVATORY OF ATHENS, Greece
- LEONHARDT ANDRÄ UND PARTNER, Germany
- TRIMO INZENIRING, Slovenia
- RUSSIAN ACADEMY OF SCIENCES, Russia
- UNIVERSITY OF CYPRUS, Cyprus



A joint workshop of the EU projects ISES, HESMOS and the starting IP project eeEmbedded was organized in the frames of the International BuildingSmart BIM week in Munich. The event was heartily discussed by over 50 professionals from different areas of academia and industry.

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