

# Semantic technologies and very traditional industries like Building

Have a look at the BaaS State of the Art (SotA) to discover how the semantic technologies (a part of Artificial Intelligence) are useful and impact more traditional industries like Building.

Today's challenge is to propose some kind of flexible open building service platform facilitating the generation and deployment of value-added building services at a considerably lower cost. This requires a data model providing additional meta-information to simplify the engineering of value-added services and applications, and the integration of legacy systems.

Imagine you want to add two different services on the platform, especially some legacy. They must access the same information but since they will have been developed by different companies on different timing, under the same format is not possible. But if your platform is equipped with some domain ontology and semantic modules, the different data formats of your services can be translated automatically and so open your platform, as an editor, to the service operators to describe how to automatically interface a new service on the platform.

For example, the Kieback&Peter Integrated Building Management System integrates all the technical equipment (like HVAC, IT, access) for operational efficiency, economy, user comfort, productivity as well as safety and reliability. Independent applications can be installed, customised and uninstalled in the iBMS at any time, with data obtained in the system supplemented by semantic and location-related information and available to all applications. To deal with dynamic adaptability, security, self-healing/self-management and low cost in the



context of a distributed system, these semantic technologies must be stretched to their limit to deliver the results of BaaS.

This SotA covers many exciting topics, including:

- self-adaptive products (Self-Management, Self-Configuration, Self-Healing, Self-Protection, Self-Optimisation)
- data mining for building automation
- semantic web
- taxonomies and ontologies
- secure authorisation using OAuth, a security protocol that allows users to grant third-party access to their (web) resources without sharing their passwords via a security token with limited rights and limited lifetime that a user may revoke at any time and thus prevent further access.
- ontologies based access control
- pervasive computing

It describes standards like:

- Constrained Application Protocol a kind of HTTP but adapted to resource constrained devices like IOT

- OSGI
- restful web service
- efficient XML interchange
- BACnet, one of the predominant standards that defines network stack and application layer for communication in building automation and control systems (BACS)
- Open Building Information Exchange is an OASIS specification with an XML-based data model that is exchanged via Web service interfaces between different building automation components.

This SotA describes all these semantic technologies, how to apply them to a traditional business and how much a traditional business can be impacted by these Artificial Intelligence technologies. Beyond the pure mathematical knowledge on AI algorithms, there is also a specific art to applying and adapting it to traditional businesses. This cross-fertilisation is surely a key place to generate value from AI and it is where ITEA is investing in a large majority of our projects.