

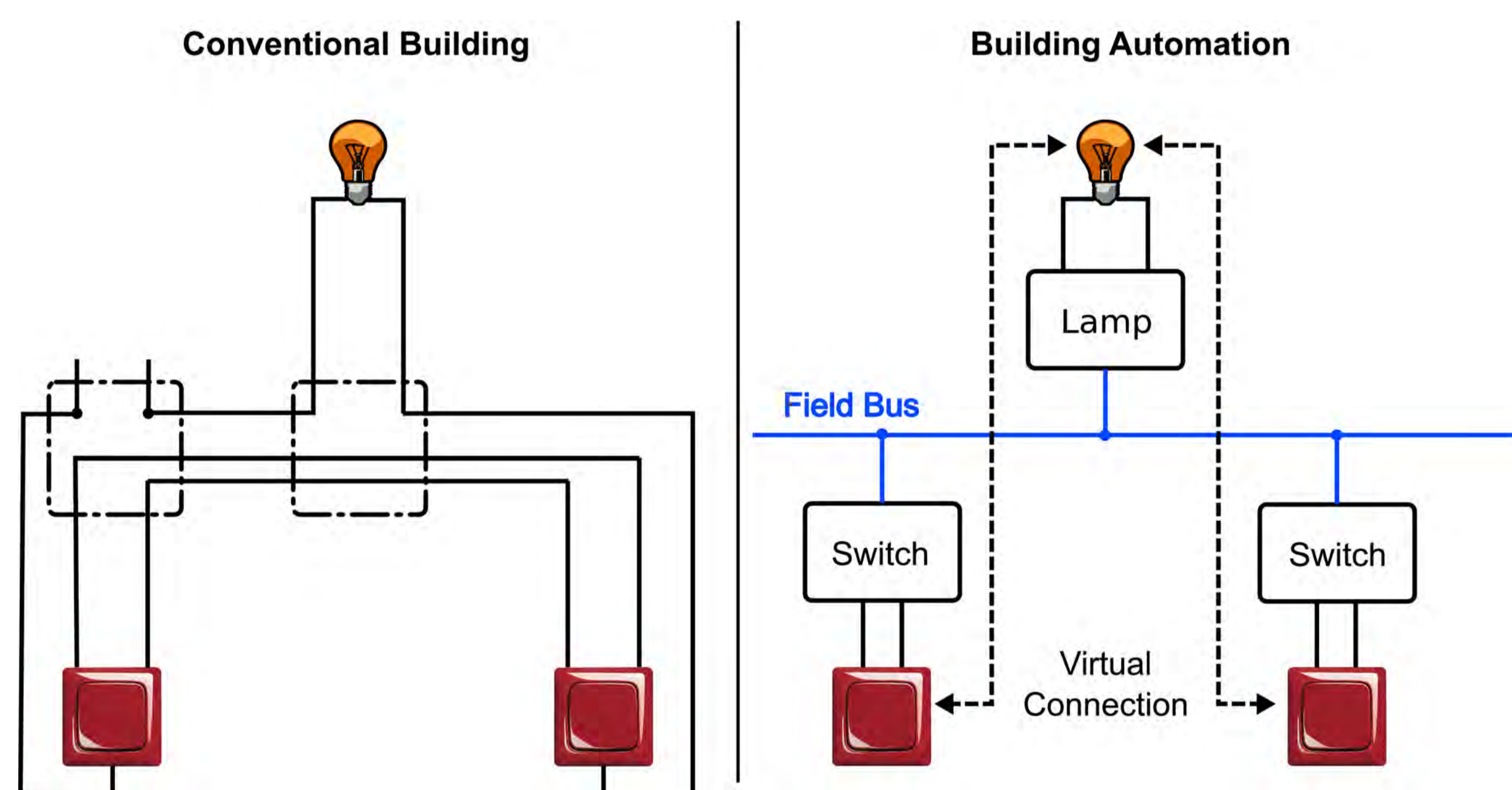
Coupling of Building Automation and Media Facades

Abstract. Media facades fundamentally alter the perception of buildings and cities by permitting buildings to dynamically change their appearance over time. It is however desirable that media facades are not treated as independent, uncoupled isles, but interact closely with the building. For instance, buildings can supply media facade systems with information about the surroundings and the building itself as well as building infrastructure can be controlled in conjunction with the content displayed on the facade. Modern building automation systems may act as both, data sources and sinks for that purpose and enable media facades to perceive and react to predefined situations and scenarios.

Building automation radically changed the ways buildings are managed and controlled. While in the past every switch and every temperature sensor was hard-wired to the assigned bulb respectively heater, today's building automation technology allows dynamically configured **Virtual Connections** between sensor and actuators.

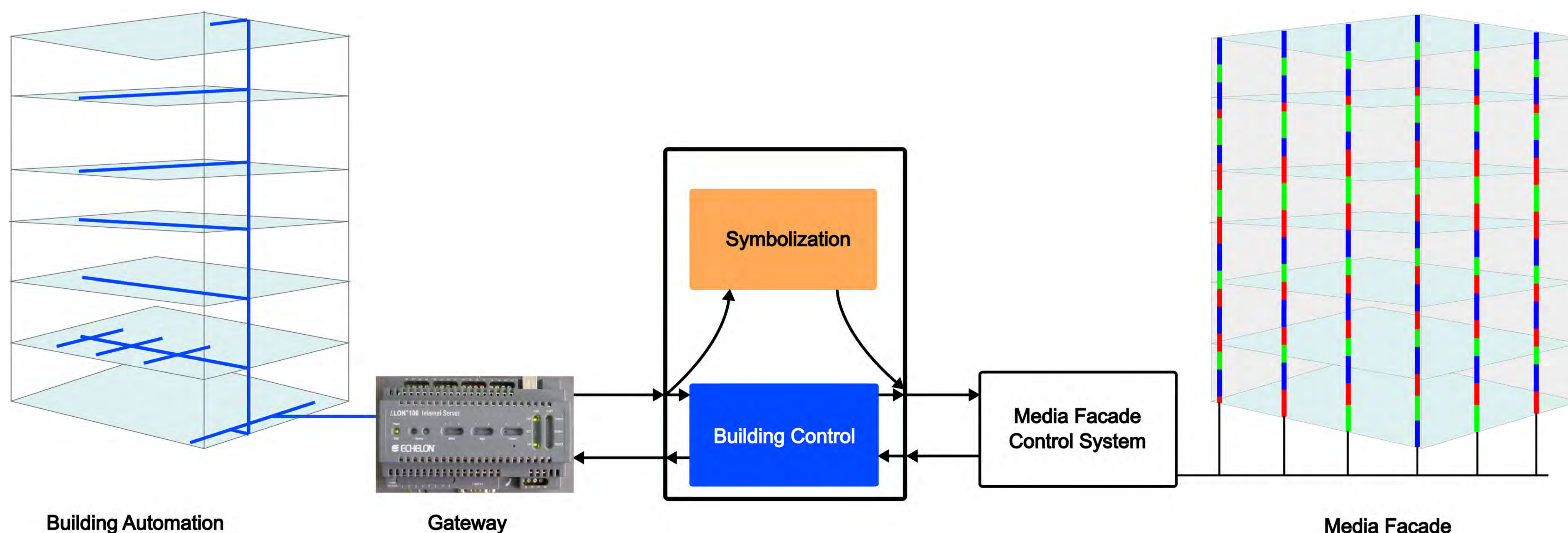
The amount of sensors and the quality of sensory data will increase further.

Building automation makes heavy use of so-called **Field Buses** to transmit measurement and control values. Today these systems are widely deployed in different types of buildings to gather information about the environment and to use that data to control and influence physical processes. In contrast to centric control systems of the past, many control decisions are calculated distributed and only some dedicated sensor values are logged centrally.



The proposed system, which is illustrated below, couples building automation and media facades in a bidirectional way:

- Relevant information may be extracted from values of building automation sensors and provided to the media facade. The extraction of relevant information out of large amounts of data is done by a process called **Symbolization** (see Artificial Recognition System (ARS) in the orange box top right).
- The media facade control system is provided with an interface to directly control building automation actuators (e.g. lights and sunblinds). The interface allows usage of these devices in correspondence with the visual content on the facade. Lights can be used to create visual effects. Or sunblinds can be used to suppress too bright room lighting while the media facade is creating visual effects.

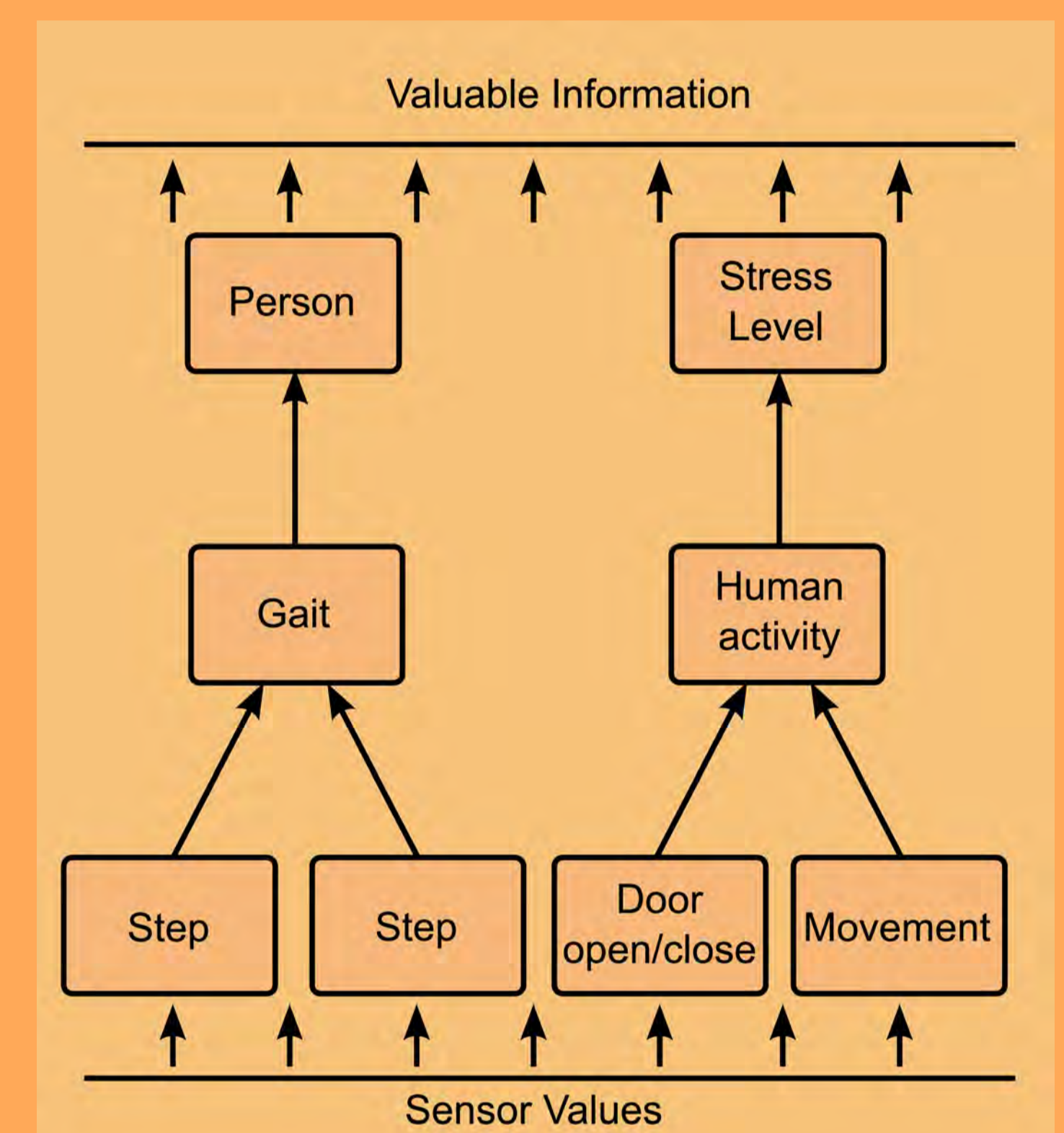


The Artificial Recognition System (ARS)

The Institute of Computer Technology has focused its research towards future systems and applications in the area of building application for many years. One promising and bright research branch combines sensor and actuator information with neuro-psychoanalytical models to create the Artificial Recognition System (ARS) that is able to detect and identify particular scenarios in buildings. Though the overall scope of the research project has its focus in the distant future, even today's systems are able to profit from the findings of the ARS project.

One aspect of ARS works by the means of **Symbolization**, meaning collecting large sets of sensor data and condensing them to small pieces of valuable information.

Media facades may use this ability of ARS to detect particular states within its building. For instance the frequency of opened and closed doors (measured by simple door contacts) may indicate the stress within a building. Though the interpretation of the sensor data is incumbent on the system engineer who sets up the ARS system, it may provide the media facade information about conditions inside the building which may be valuable to find some representation on the outside



Media facades can use building automation to retrieve information and to create visual effects.

Building automation systems have changed much in the last 20 years, and they will continue to do so in the next 20. **Detection of scenarios** in large volumes of sensor information and **seamless integration of media facades** are tasks that future systems will have to cope with.

By coupling media facades with building automation, the acquired situation-dependent information can contribute dynamically to the images depicted on the facade. Vice versa, building automation systems can support many visual impressions of the building by actively controlling actuators like lighting in synchronization with the facade, resulting in an augmented over-all visual appearance of the building. Building automation will not only support media facades, it will create automated media buildings.

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