Opportunistic applications, interoperability, user interfaces in building and home automation.

Building and home automation based on single-shot project can be useful to replace with step by step automation according to momental financial possibilities and emerging new hardware and software solutions. It is very much simplified by wireless communication technologies due to elimination of cabling and also by **opportunistic software applications** enabling automatic discovery and using of all for given application accessible resources. The resources in this case can be small, functionally easy (e.g. temperature sensor), or bigger objects (e.g. refrigerator) equipped with microcontrollers and able to communicate either wireless (e.g. using ZigBee) or over wire (using e.g. Ethernet). Interoperability of legacy and new systems and also using of such user interfaces which can be used by broad user spectrum of users is very important for the ad hoc automation.

Products and development services of SAE-Automation s.r.o. (Ltd.) are already longer time oriented on software solutions for interoperability and user interfaces. In the area of opportunistic applications, SAE started its activity within European project POBICOS (www.ict-pobicos.eu)[1] together with Finnish R&D institution VTT, Warsaw University of Technology, Centre for Research and Technology in Thessaly, Accenture Technology Labs in France, Centre for Renewable Energy Sources (CRES) in Athens. Opportunistic application based on POBICOS development platform consists of a few software micro-agents. User will be able to buy such application within application pill – a small microcontroller module using e.g. ZigBee protocol to transfer of the micro agents to all objects enabling functionality of a given type of the micro-agent. For example, temperature measuring agents will be placed on the objects equipped with temperature sensors.
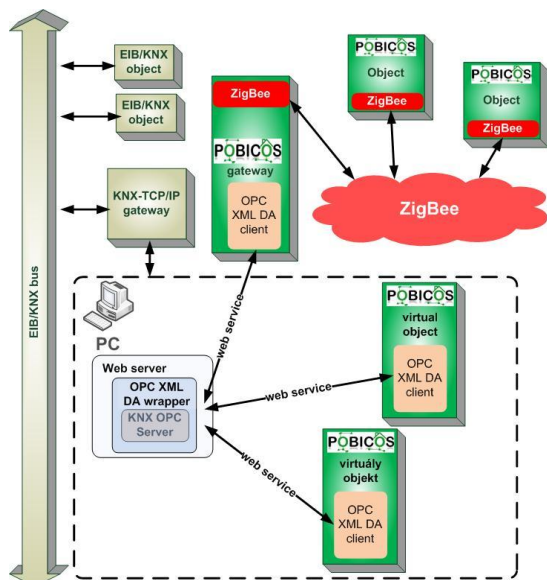

Fig.1 The interoperability of the POBICOS platform with EIB/KNX modules using OPC and web services.

One of the first POBICOS test applications for bioclimatic experimental building in CRES Athens provides the fulfilment of requirement from electricity power supplier to reduce the power consumption of different electrical devices by the initiation of the device power saving mode with minimizing of impact on the users comfort.

EIB/KNX platform in CRES, alike as other building automation systems as e.g. BACnet, LONworks use OPC client/server communication e.g. to connect with visualisation systems. More than the 10 year's experience of SAE Automation in OPC software products development as well as product of this company OpcDbGateway™ enabled to solve problem of POBICOS interoperability easily and effectively. We have developed an **OPC XML DA clienta in the language ANSI C. It enables high portability on different computer modules.** The cooperation of this client with OPC DA servers in building automation systems is provided by using of XML DA wrappers. OPC XML DA standard uses **web services** and so is enabled **the POBICOS platform cooperation with legacy systems also over Internet.**
Deployment of new system in the used building is risky and so it was necessary to find a way of the building automation system modelling Because of providing POBICOS interoperability using OPC, very convenient for this purpose is the software OpcDbGateway™ which alike as EIB/KNX platform in CRES can communicate with POBICOS platform. Arbitrary data handling application for OpcDbGateway can be, alike as address space of the internal OPC server configured using the configuration application. It is less laborious than programming. Creation of the building automation system model has been simplified this way very much.

For the building automation, another SAE product is also very useful - **SAEAUT SNMP OPC Server** enabling integration of computers, printers, switches, UPS, I/O modules using SNMP protocol to building automation system.

User interfaces (UI) of the home have to be usable by users with different knowledge and experiences. These features have at present first of all two devices – mobile phones and TV with remote control. By enhancement and by client applications to the product SAEAUT SMS Service is possible to create this kind of the UI.

The platform **Windows Media Center®** enables to develop applications integrating multimedia activities as browsing of photos and video with control of HVAC, security system and other functions of the automated home. **SAE-Automation has experiences with development on the mentioned platform with using of MCML language.**

The web application SAEAUT OPC Explorer, using AJAX and OPC XML DA. Technology, can be used as **UI over a web explorer**. Basic data views in the shape of none structured list as well as a tree view is to disposal immediately within this application. There is also a possibility to enhance application with different graphical representations of data using arbitrary HTML editor. This application, together with the application OpcDbGateway, provide integrated platform for monitoring and control of the home and building automation systems.