Ensuring universal access in digital homes makes for an easier life

Growing intelligence available in all types of domestic equipment – from TVs to fridges – demands open access to simplify operation and interactions in the smart networked homes of the future.

The EUREKA ITEA software Cluster ANSO project makes possible the seamless integration of domestic networked multimedia, home control and communications devices, providing universal access to computing and entertainment services. As a result, intelligent sensors, actuators, wireless networks and terminal devices will blend into our daily living environments. More citizens will gain access to digital services and have a much greater choice when mixing services and appliances to suit specific needs. This will dramatically accelerate development of new networked multimedia services and content as well as their use in building innovative applications to boost smart digital home services in Europe.

As you stare at the pile of remote controls, set-top boxes, video devices and other devices in your living room, have you though longingly about having just one gadget that could handle everything. Yet, as ever more appliances gain intelligence – from smart fridges to clever heating and lighting systems, the problems seem set to grow. So, think how nice it would be to have a fully interworking network of home gadgets starting from your TV and ending at your mobile phone or even your garage door.

ANSO has made a major step towards such a dream by promoting open interfaces to replace proprietary and vendor-locked systems. It has developed an applications platform and related software technologies that enable access to a wide range of novel applications combining home automation, communications and multimedia choice.

Incompatible standards

"The main problem now lies in the overabundant and overwhelming variety of incompatible standards and technologies in home automation, communications and multimedia systems," explains project leader Tommi Aihkisalo of Finnish research institute VTT. "There are dozens of home control and automation networks and protocols available and even more in the field of multimedia and communications. All these technologies are competing with each other and are incompatible – lacking intercommunications abilities."

The project outline was drafted by a Greek partner unable to participate due to lack of funding. The lead was taken over by VTT. An enthusiastic and highly competent consortium of industrial and academic partners from three countries then carried out the project. Their experience ranged from development of networking equipment to service provisioning, software/protocol development and network operations.

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> **Tommi Aihkisalo -** *VTT, Finland*

"ITEA provided the ideal project framework," explains Aihkisalo. "While the framework offered a common playground and set of rules for working together, it also required discipline from the partners and the project management. The rules are enforced and checked in ITEA project reviews, where all results and issues are presented. Within this framework it was easy to

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gather interested partners and enable co-operation. In addition, an important factor for the partners was that ITEA labelling itself helped in finding funding from public authorities."

Homogeneous access

To ensure it met real world needs, ANSO studied and evaluated market and end-user needs through a public survey and interviews with technical experts. It quickly realised the variety of standards would have to continue to coexist. That is why the main contribution of the project has been a unified middleware solution for interoperability – middleware enables incompatible hardware and software systems to communicate and interact.

All the novel applications enabled by the developed platform and

living for disabled or elderly people; home networking; communications applications; and multimedia applications and devices such as video-on-demand, set-top boxes and context-aware Internet applications.

As an example, a completely new application was developed combining TV watching, instant messaging and notifications from the networked home appliances. Here, the TV viewer is able to send comments on a TV show to friends and receive a notification from a malfunctioning fridge if necessary – opening any number of possibilities.

Home robot

"Many of the applications developed are geared towards enabling an aging population to stay healthy and active for longer in their own homes," adds

top of which is mounted a manipulator arm. A laser range-finder sensor provides autonomous navigation and security functionalities. The arm holds a gripper for object manipulation; low-cost cameras are set on the gripper to give video feedback to the operator. These cameras also used to enable a visual grasping function.

The robot companion is able to interact with the home environment using the middleware developed in ANSO; it controls and communicates with the environment to help it in its tasks – such as controlling home lights to improve illumination for its imaging systems. Using patented technologies, the user is easily able to designate what he/she wants the robot to fetch just by clicking the object in the image.

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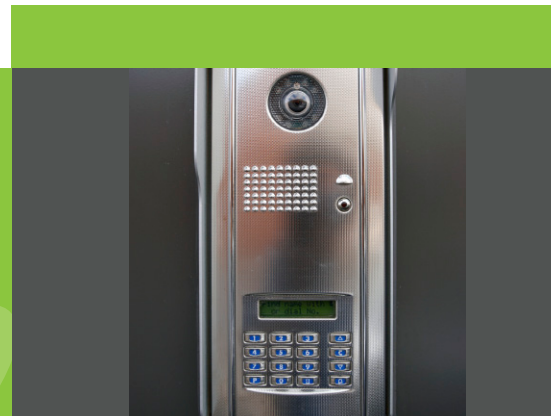
related technologies combine home automation, telecommunications and networked multimedia. The main benefit is the interoperability of these different technology domains, with the provision of homogeneous access. Major applications include: home gateways allowing home-automation applications such as security, remote control and management; assisted

Aihkisalo. A particularly interesting application investigated was an automatic home-assistance system involving a robotic companion for disabled or elderly occupants.

Synthetic Autonomous Majorduomo (SAM) is a companion robot designed for assistance and service functions. It is composed of a mobile platform on

Overall, as a result of ANSO, consumers will have access to higher quality equipment and services providing greater variety and interoperability in a wide range of applications.

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