TECHNICAL DIGEST

Smart Spaces

RECOCAPE REinforcing COoperation CAPacity of Egypt

SECC Software Engineering Competence Center

What are Smart Spaces?

Smart spaces refer to any type of environment (e.g., homes, offices, hospitals, schools) that is equipped with variety of devices, sensors, and actuators that cooperate to provide its users with convenience, safety, security, and comfort.

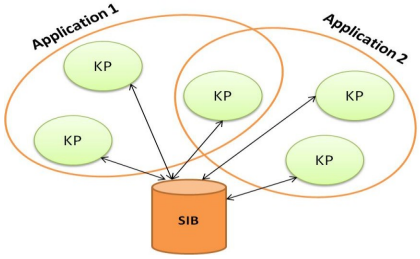
Smart spaces have been always viewed as a luxurious feature. However, business models developed for smart environments show an increasing potential for the adoption of smart spaces to improve the quality and even save people's lives.

In a smart hospital scenario, for example, RFID tags can be attached to patients, drug packages, and medical equipments. Physicians and nurses can access patients' medical records saved on their RFID tags when necessary via their handheld devices equipped with RFID readers. Through this identification, correct operations can be ensured to the correct patient. Medical equipments can be tracked and secured from being stolen.

Semantic Smart Environments and Smart-M3 Architecture

Semantic technology is a way to enable data to be machine understandable. This way, data can be directly and indirectly processed by machines. This technology is extremely useful in areas where concepts have multiple names in different countries. Moreover, more and more data is available from many sources and this enables the development of rich application scenarios if the application can interpret and understand the data. Exploiting the semantic technology in smart environments can provide good use cases that raise the quality of service and save people's lives. The semantic smart environment is a combination of a physical environment, a middleware infrastructure for data management, a collection of embedded systems gathering heterogeneous data from the environment, and a connectivity solution to convey these data to the application layer. In order to adopt semantic technology, relations among data are described using Resource Description Framework (RDF). The main principle upon which RDF is built is that everything is a resource. A resource is uniquely identified using Universal Resource Identifier (URI). Each resource has a type, properties, and relations that link it with other resources that are described in the form of triples <subject, predicate, object>.

SMART-M3 is an open source architecture (http://sourceforge.net/projects/smart-m3/) that facilitates the development of such semantic smart environment applications. Smart-M3 consists of two main components: semantic information broker (SIB) and knowledge processors (KPs). The environment information is semantically stored in one or more SIBs. In the simplest case, one SIB will store all information about the environment. Collaboration of KPs forms the application. The KPs co-operating in different scenarios are loosely coupled The Smart Space Access Protocol (SSAP) is the protocol that the KPs use to access the SIB. The principles guiding the design of Smart-M3 are simplicity, extensibility and being agnostic to the used communication mechanisms.



Smart-M3 allows an indefinite set of interoperability use cases to be implemented by defining the concepts of domains in domain-specific ontologies and standardizing them. Smart-M3 is publicly available under BSD open source license and thus suitable for both research purposes and industrial use.

Smart Space in SECC

Smart spaces is a relatively new technology, Small and Medium Enterprises (SMEs) can tap into new business opportunities by exploiting existing open source architectures to develop applications for smart environments to solve pressing societal problems. Software Engineering Competence Center (SECC) provides a specialized support to adopt semantic smart environments. This is achieved by helping organizations to exploit the benefits of semantic smart environments through training courses as well as providing hands-on-experience on how to practically implement real smart spaces through consultation services. For more information visit http://www.secc.org.eg/RECOCAPE/ .

Contact Us 16248 info@secc.org.eg **Follow Us**