Smart Room Service Set at Petrozavodsk State University: Initial State

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Abstract

We consider initial specification, design, and implementation of a service set for smart rooms. They are to be deployed at Petrozavodsk State University for automated and intelligent support of conferences, lectures, and meetings. The development follows the smart spaces concept and uses the Smart-M3 platform for the implementation. The recent version will be demonstrated at the 12th FRUCT Conference.

Index Terms: Smart spaces, Smart-M3, Smart Room.

Nowadays modern paradigms such as ubiquitous computing and ambient intelligence are developed rapidly. As a result, various smart environments have been being created [1]. The smart spaces concept and its open source implementation—Smart-M3 platform—are convenient for constructing such environments [2], [3]. In this abstract, we consider the key design principles that we used in the smart room development. The smart room aims at holding automated conferences, meetings, and lectures at Petrozavodsk State University (PetrSU). The development is based on the advanced Smart-M3 SDK [4] and inherits the FRUCT groundwork on Smart Conference and SmartScribo systems [5], [6].

The PetrSU Smart room is based on the service set principle. Any service is implemented as a smart space agent that performs functions on client demand and/or provides information related to specific component of the room. The service set principle implies that some set of services (which can dynamically change their state between active and inactive) are available at the moment and are offered to participants in the room. Every service can be accessed from client agent installed on user mobile devices. Although the services are available for all participants, a specific service subset is offered for each person based on his preferences and current context. It allows implementing personalization and proactivity in service provision.

The smart room service set consists of several services (Fig. 1). Conference services (SmartConference system) include: agenda and projector services. Agenda service handles the runtime of conference and according to schedule starts a speech of particular participant. Agenda and additional information (such as conference event visualisation) is displayed on separate screen. Agenda service interacts with projector service and notifies it which presentation need to be shown. Projector service starts to show this presentation on smart board and then waits for commands from speaker. Speaker using his mobile device or sensor smart board informs projector about slides switching or presentation ending. Conference is supplemented with blogging system which allows to lead discussions during the speech.

Internal services form or analyze smart room environment and provide related information to users. They can take and represent information from sensors embedded in the room

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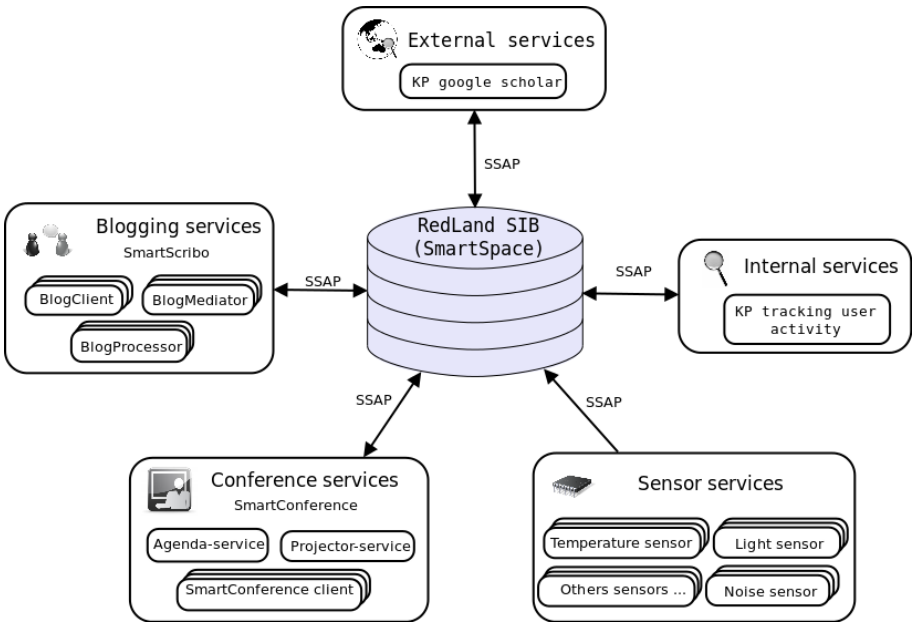

Fig. 1. Smart room multi-service architecture.

(temperature, lightning, etc.) which is published by sensor services. Another example is services that analyze activity of each participant, e.g., based on her/his personal speeches and questions metrics or contribution rate to the discussion with help of cameras and mikes. All content produced in the room is accumulated by internal services in content collection.

External services provide additional information to the smart room by the means of other external entities (web sites, data bases, etc.). An example is a service that accesses Google Scholar to provide the smart room with information about speaker citation index.

PetrSU service set is in active development phase. Initial implementations of projector and agenda services have been created and planned for testing. Further work will be dedicated to smart room client implementation (based on developed clients [7]) and other services design.

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