

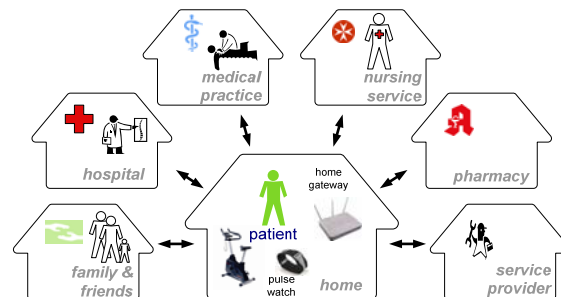
OSAMI Commons - Open Source AMbient Intelligence *Software-Platform for Flexible Distributed Service Systems*

The utilization of adaptive software components supports the cooperation of heterogeneous medical devices and services. These devices and services complement each other and adapt automatically to changing requirements, environments and tasks.

Objectives of the ITEA 2 Project OSAMI

Up until now flexible combinations of cooperating devices and software components are difficult to implement, particularly in the field of embedded systems. This is the result of a wide variety of special, partly proprietary communication protocols and interfaces. The application of service-oriented architectures (SOA) and the use of broadly accepted, open standards can be regarded as a solution to this problem.

The aim of the international ITEA 2 project OSAMI is the design of a basic SOA-capable component platform, its development, test and its provision as open source software. The project consists of a number of national subprojects, each focussing on a certain field of application. The German subproject contributes to the eHealth domain. The main objectives are interoperability, maintainability, reliability, as well as automated configuration and management of medical devices and services to provide new forms of healthcare to diseased and convalescent people. The advantages of these technical contributions will be demonstrated by means of an eHealth application which supports ambulant cardiological rehabilitation.



Many different standards for communication, data models and interfaces are used in the eHealth domain. Their complexity and the resulting investments are major obstacles, which deter particularly SMEs from entering this market.

The open, modular and extensible OSAMI platform provides unified interfaces and comprehensive system functions to facilitate the market entry for SMEs.

The aging society causes increasing healthcare expenses and requires the efficient and quality assured development of innovative medical devices, services and applications. The home care of patients will be considerably changed and substantially improved.

Key technologies

The software component platform from the OSGi Alliance forms the technical basis of the OSAMI platform. It provides lifecycle management for software components as well as local service interactions as defined in service-oriented architectures and will be combined with the Web Services (WS) approach in order to implement distributed, dynamically configurable, vendor-neutral and device-independent solutions.

Interoperability of medical device ensembles

The number of personal, medical diagnostic and therapeutic devices is steadily increasing. The distribution of data for further processing and archiving (e.g. for healthcare telematics

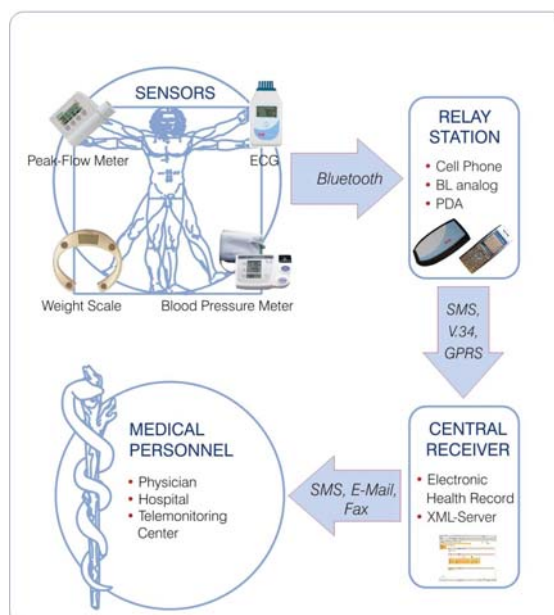
systems) is required, but as of now limited due to the lack of missing standards. The use of WS, allows users and service providers to exchange relevant data on demand while taking strict privacy and data security requirements into consideration.

Integrated healthcare

The aim of integrated healthcare is a seamless conjunction of ambulant and stationary therapies in order to improve the medical quality. A close collaboration of general practitioners, medical specialists and hospitals is inevitable. Our project contributes to integrated healthcare by providing a strong technical basis for innovative telemedical services.

Configuration and management of adaptive service systems

OSAMI systems shall adapt automatically to changing requirements and environments. New devices and services have to be integrated automatically and may lead to a reconfiguration of the system. Users, applications, and provider objectives, as well as preferences, constraints and technical prerequisites are represented by policy sets. These policies can be defined comfortably on a high abstraction level. They are refined automatically into low-level policies which are enforced at run-time and which control the evolution of the adaptable service system.



Intelligent technical management

Heterogeneous and high dynamic environments require new innovative management concepts. The quality of the system has to be ensured by quickly reacting functions for fault, configuration, accounting, performance and security control. Therefore OSAMI will develop new approaches for automated management as well as preventive maintenance, administration and support, which are accompanied by improved fault tolerance, self-optimization and self-healing functions.

Fields of application

Hospital: Hospitals record diagnostic and therapeutic data, which are to be accessible for authorized external parties. This approach guarantees immediate access to the case history of a patient. Existing hospital information systems can be integrated seamlessly into OSAMI applications. For that reason vendor-neutral and format-independent interfaces are provided. The rehabilitation therapy after hospitalisation, which should preferably take place at the pa-

tient's home, is supervised by the hospital. The hospital defines patient-specific rehabilitation plans and supplies the necessary medical devices (e.g., ECG device). These devices are configured automatically according to the rehabilitation plan and the home environment.

Medical practice: The practitioner acts as a link between the patient and hospital. He controls the convalescence, modifies the training programmes depending on the patient's medical condition and – if necessary – initiates his referral back to the hospital.

Home environment: The home environment comprises a variety of standard devices (e.g., PCs, smartphones, PDAs, DSL-routers), which are complemented by specialised medical devices. Data from medical sensors will be collected, forwarded and analysed. The system starts predefined procedures once a critical condition occurs. Depending on the condition, the current configuration of the system as well as the predefined policies, the data may be transferred online to a medical supervisor or locally stored for an offline analysis at a later time.

Device manufacturer: Devices and services from different vendors and providers can be flexibly combined across application boundaries. This allows especially SMEs to enter this market.

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Project information

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