

## Project Profile

# Advanced Infrastructure for Medical Equipment Management and Services

## Tailoring support strategies for medical equipment management and services

*The goal of AIMES is to develop a service infrastructure for hospital technical facilities. It covers the integration of management tools into appropriate communications infrastructures, distributed condition monitoring, diagnosis and remote access to medical equipment. AIMES is also concerned with the management and tracking of mobile medical equipment using radio frequency identification (RFID) technology as well as a dynamic management of nomadic service personnel.*

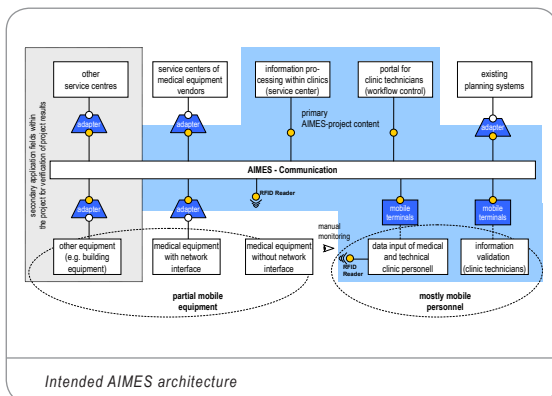
higher systems availability, expert know-how, field service availability and logistic materials. The crucial trade-off is to provide economic and partly self-maintained customer solutions together with critical and sensitive high-tech medical equipment.

### BEYOND EQUIPMENT MAINTENANCE

The AIMES platform goes beyond medical equipment maintenance. It will offer a extensible service infrastructure for the overall hospital technical facilities, covering the integration of management tools into the communications infrastructure, distributed condition monitoring, diagnosis and remote access to medical equipment, as well as management and tracking of mobile medical equipment.

This goal will be achieved by analysing:

- Automated alert messaging of equipment status and triggering of corrective measures according to customer business processes – e.g. internal first-level support, maintenance interventions by the manufacturer or third-party service providers.
- Clinic technicians and authorised personnel – manufacturer and third parties – will get transparent but limited access to context-aware information regarding medical equipment.
- Preventive maintenance solutions for medical equipment – hosted within the hospital or at equipment specialists – where possible. This may lead to new service models for online prediction of equipment failure and prevention of downtime.
- Optimised co-operation between medical personnel and technicians in hospitals and at service centres – equipment vendors and third parties.



Today, for success in global markets, competitiveness is defined by meeting customer expectations in terms of high quality at a low price, partly driven by cost pressures in the public healthcare sector. In addition, service business is more diversified by higher demands on the service provided by manufacturers for medical equipment, together with the combination and integration of different technologies, extensive use of software applications and networks tailored to specific customer needs.

Critical return-on-investment considerations of overall life-cycle costs and the need to leverage local service organisations must be balanced by an increased demand for

## AIMES

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### ■ Partners

Dräger Medical AG & Co. KG  
 enverdis GmbH  
 FEIG ELECTRONIC GmbH  
 ifak e.V. Magdeburg  
 INDRA Sistemas  
 RGB Medical Devices S.A.  
 SBSK GmbH & Co. KG  
 Siemens AG  
 SUINSA Medical Systems S.A.  
 TELEFONICA I+D  
 Universitätsklinikum Magdeburg  
 University of Girona

### ■ Countries involved

Germany  
 Spain

### ■ Project start

May 2008

### ■ Project end

October 2010

### ■ Contact

*Project Leader :*

Dr. Andreas Zeidler  
 Siemens AG, Germany

*Email :*

A.Zeidler@siemens.com

*Project website :*

<http://www.aimes-project.eu>

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- Dynamic management and data provisioning for service personnel, planning of operations, scheduling of medical – patient-related – and internal and external technical services.
- Optimised use of equipment and personnel by allocating the correct and nearest equipment – e.g. by leveraging RFID input – to the right task, taking into account life expectancy of the equipment, use profile of equipment, availability needs in the hospital, and maintenance schedules and other factors.
- Optimised equipment information management and reuse in various applications across different life-cycle phases of the equipment, even offering the capability to feed-back operational data from later life cycle phases into manufacturers' product design or hospitals' procurements.
- Tracking of mobile equipment within a clinic – given that medical equipment may be mobile in the same way as clinic and service personnel.

### FLEXIBLE AND EXTENSIBLE INFRASTRUCTURE

The central challenge is to define a flexible and extensible infrastructure supporting different kinds of medical equipment and personnel, employing an integrated overarching customer workflow to reduce maintenance costs and optimise use of medical devices. The infrastructure must be secure, scalable and based on open standardised interfaces to facilitate integration of new components and devices.

AIMES is therefore addressing the following technical challenges:

- Definition of a service infrastructure supporting fixed and mobile equipment;
- Equipment modelling with special attention to data distribution, security and consistency between RFID data, the equipment itself and within software tools.
- Introduction of standard interfaces and open transfer formats across infrastructural borders – focusing on international standardisation of medical equipment interfaces.
- Consideration of strong security policies, typical for medical applications, legal regulations and manufacturers' best practices.

### SUPPORTING TAILORED STRATEGIES

The AIMES project will define the appropriate support to allow the adaptation of strategies for hospital facilities and service management to legal requirements, patient needs, and technical and economic demands. The solution obtained should be exploitable in hospital environments and provide contributions to standards.

Four results are foreseen:

1. Creation of advanced models, concepts and strategies for facility and service management, leveraging use of smart components such as RFID or electronic equipment memory. This enables equipment tracking and tracing, condition monitoring and mobile applications within hospitals executed on a suitable – future – platform. The platform will be based on a service-oriented architecture (SOA) enabling medical equipment to report failures and abnormal situations. Such events will be generated by different types of agents following business-process roles.
2. Prototype implementations for the specified concepts and strategies that will benefit device manufacturers and improve remote service capabilities of their products. Software tool manufacturers will also be able to improve their tools' capabilities.
3. A real-life demonstrator of project achievements in a hospital environment – service platform, equipment tracking, facility management, condition monitoring and scheduling of mobile service personnel, all supported by appropriate tools – sustaining optimised business cases.
4. Planned publication and participation in international conferences and workshops.

A preliminary market analysis identifies several user groups potentially benefiting from the expected project results:

- Operators of medical equipment and hospitals.
- Manufacturers of medical equipment.
- Facility and service management software manufacturers.
- Service providers.
- RFID and other infrastructure equipment manufacturers.
- Management and control staff within facilities using medical equipment.

### ITEA 2 Office

High Tech Campus 69 - 3  
5656 AG Eindhoven  
The Netherlands

Tel : +31 88 003 6136  
Fax : +31 88 003 6130  
Email : itea2@itea2.org  
Web : www.itea2.org

- ITEA 2 – Information Technology for European Advancement – is Europe's premier co-operative R&D programme driving pre-competitive research on embedded and distributed software-intensive systems and services. As a EUREKA strategic Cluster, we support co-ordinated national funding submissions and provide the link between those who provide finance, technology and software engineering. Our aim is to mobilise a total of 20,000 person-years over the full eight-year period of our programme from 2006 to 2013.

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- ITEA 2 projects involve complementary R&D from at least two companies in two countries. We issue annual Calls for Projects, evaluate projects and help bring research partners together. Our projects are open to partners from large industrial companies and small and medium-sized enterprises (SMEs) as well as public research institutes and universities.



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