

Project Results

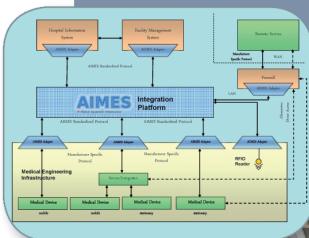
Improving medical equipment management

Advanced integrated service infrastructure lowers high-tech healthcare costs

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ENABLED SERVICE QUALITY



New concepts in service management and services for medical equipment are essential to cut costs within public healthcare systems. The ITEA 2 AIMS project has developed a fully integrated service infrastructure covering the integration of management tools into an appropriate communications infrastructure, distributed condition monitoring, diagnosis and remote access to medical equipment. It also enables management and tracking of mobile medical devices using radio-frequency identification (RFID).

Healthcare organisations have increasingly to balance increased demands for systems availability, expert know-how, field service and materials logistics with the need for economic service solutions. Moreover, healthcare providers want to have information technology (IT) systems offering totally integrated asset, quality and supplier management covering new and legacy equipment. This has resulted in a strong move to independent service organisations and third-party subcontractors with open systems to avoid lock-in.

FULLY INTEGRATED PROCESS

Today, more than 50% of the total life cycle cost of medical equipment lies in technical service, yet work processes have been old fashioned with no integrated supply chains and service requests relying on paper and phone ordering. AIMS developed a fully integrated approach to reduce manual processes, cut errors and improve quality with modern electronic business processes for suppliers and hospitals.

The approach was based on:

- A flexible and extensible **service platform** to meet new requirements and technologies, with mobility and context awareness for devices and technicians;
- A **service-oriented architecture (SOA)** infrastructure separating workflow and process information messages;
- **RFID technology** to simplify location and allocation of equipment with web-integration technologies to keep track inside and outside the hospital;
- The software **Enterprise-Service Bus** as underlying infrastructure integrator, providing communications services through an event-driven and standards-based messaging engine; and
- **Data mining and knowledge extraction** to enhance maintenance though increased use of preventive and predictive servicing.

Key elements involved: RFID-based logistics management of medical

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Partners

Aviant
 Dräger Medical
 FEIG ELECTRONIC
 Institut für Automation und Kommunikation (IFAK)
 INDRA Sistemas
 RGB Medical Devices
 SBSK
 Siemens
 TELEFONICA I+D
 University of Girona
 University of Magdeburg

Countries involved

Germany
 Spain

Project start

May 2008

Project end

December 2010

Contact

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Project Results

equipment, including inventory control, tracking and dynamic scheduling, supported by appropriate tools; medical equipment maintenance involving development of algorithms to support condition monitoring, diagnosis and prediction as well use of co-operative tools for service management, particularly planning of interventions and co-ordination of therapies with equipment use; and development of adaptable user interfaces depending on specific task.

In addition, the ITEA 2 project focused on the development of a suitable infrastructure to enable these applications in terms of networking of equipment, tools and personnel in a mobile and secure environment, networking with external equipment manufacturers and service partners.

TECHNOLOGICAL ADVANCES

Technological advances included the development of an RFID reader with certification for use in hospitals. This product has been nominated for several design awards and will be commercialised by project partner FEIG.

An end-to-end mobility- and context-awareness demonstration, based on standard smart phones, showed that from identification of a problem in the hospital until the resolution of the incident by the device manufacturer's service technician could be done without leaving the IT domain. This was completely new

in the medical equipment service field and demonstrated the added value of mobile devices and mobile technology.

AIMES also demonstrated end-to-end integration between hospitals and manufacturers using web-service technology. A hospital can access a device directly and obtain its status. A large part of this work accepted for consideration by the ISO 11073 committee on health informatics as an extension to the standard to cover technical service.

Device manufacturers can leverage the results for the service integration with hospitals on all possible levels of their (remote) service organisations. For example, although Siemens already has a very high degree of predictive and preventive maintenance built into the device, still the integration with the processes of the hospitals is considered to be beneficial and the logical next step. For others, the integration on the device level opens up whole new business opportunities for the creation of a service business together with the healthcare organisation.

BENEFITS AT ALL LEVELS

AIMES has been a success in an area where Europe had to take action – IBM and Oracle are already very active in the USA. Moreover, suppliers, health services and patients will all benefit as the outcome will be lower costs for high technology healthcare.

Major project outcomes

DISSEMINATION

- 20 publications (prepared and in preparation)
- 5 external promotion actions at conferences/fairs
- 3 internal promotion actions of partners

EXPLOITATION

- 1 product

STANDARDISATION

- 1 proposal to standardisation bodies (ISO 11073)

SPIN-OFFS

- 1 Spin-off: "NEWRONIA"

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■ 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.

■ ITEA 2-labelled projects are industry-driven initiatives building vital middleware and preparing standards to lay the foundations for the next generation of products, systems, appliances and services. Our programme results in real product innovation that boosts European competitiveness in a wide range of industries. Specifically, we play a key role in crucial application domains where software dominates, such as aerospace, automotive, consumer electronics, healthcare/medical systems and telecommunications.

■ 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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(ITEA 2 - 07017)

October 2011