

Fact Sheet

Radio Frequency Identification (RFID) in Health Care

This Fact Sheet summarizes some of the main facts about the three pilots carried out:

- Person and patient logistics in the operating rooms;
- Tracking and tracing of operating room materials;
- Tracking and tracing of blood products.

Technology

Active RFID technology provided by Avonwood Developments Ltd, United Kingdom

- Avonwood Eureka iD Secure Card Tag for professionals
- Avonwood, Eureka iD Wrist Band Tag Assembly for patients
- Avonwood, Eureka iD Temperature Tag Assembly for blood products
- Avonwood, Eureka iD Reader (LAN) Unit Assembly, 868 MHz
- Avonwood, Eureka iD Wakeup Unit Assembly and Wakeup Antenna, 125 kHz

Passive RFID technology provided by PHI DATA, The Netherlands

- KSW Tempsens tag for blood products
- FEIG Reader for KSW Tempsens tags, 13.56 MHz
- TI/Impinj EPCglobal Gen2 compatible tag for materials
- FEIG Reader for EPCglobal Gen2 tags, 868 MHz
- Handheld scanners: Intermec 700 Series Color mobile computers with IP4 Portable RFID Reader running Oracle Mobile Sensor Edge and Oracle Lite database

Server technology provided by HP The Netherlands

- HP Proliant server with Intel Xeon 3.4GHz 2MB 370/380 G4 Processor running Microsoft Windows Server 2003

Client technology provided by HP The Netherlands

- HP Compaq dc7600 with Intel Pentium4 521 (2.8/800/1M) running Microsoft Windows XP

Database and middleware technology provided by Oracle The Netherlands

- Oracle Database Server (version 10.2.0.10)
- Oracle Application Server (version 10.1.2.0.2)
- Oracle Sensor Edge Server

Application technology provided by Geodan Mobile Solutions, The Netherlands

- Geodan Movida version 1.3.0.23

Physical locations

Active monitoring of persons, patients and blood products has taken place at the following locations:

- Entry and exit of the operating room complex through the main entrance

- Entry and exit of the operating room complex from the recovery room
- Entry and exit of four individual operating rooms within the complex
- Entry and exit of the recovery room through the main entrance
- Entry and exit of the intensive care unit through the main entrance

In addition, the active tags on blood products are used in the transfusion laboratory for identification and temperature read-out. Also, the active tags are removed from the blood products once they are used in either the OR or the IC. They are then placed in a “stop-bucket”, which also registers the active RFID tag, indicating the blood product has been used for transfusion.

Passive RFID on blood products is scanned only at the transfusion laboratory for identification and temperature read-out.

Passive RFID on materials is used in the following locations:

- Unit Storage next to two adjacent operating rooms; a handheld scanner is employed to scan the contents of a sealed thematic OR basket in the materials cart before rolling it into the OR for surgery;
- Garbage Disposal, located at the perimeter of the OR complex; stationary scanners register the tags on the packaging of used materials;
- Logistics Distribution Center, located at the perimeter of the OR complex; a handheld scanner is employed to scan the contents of one thematic OR basket upon return from being used during an operation.

Pilot observations

During the pilot period a number of observations have been registered by the RFID infrastructure. When we relate these readings to actual processes in the context of the hospital we arrive at the number of valid observations we have used for our analysis. The actual number of observations, especially during the early stages of the pilot, is much larger. However, a lot of those observations had missing data, due to ongoing fine-tuning of the infrastructure. For patients and professionals, we have related their presence in an operating room to an actual surgery taking place. The reason fewer patients have been monitored than the number of surgeries can be explained by the fact that professionals were wearing their RFID badges all day, whereas not all patients on a given day were provided with tags. The same is true for the limited number of blood products. Not all operations identified required blood products, and not all blood products have been tagged. The number of materials was limited due to construction activities in the garbage disposal room. This caused a relocation of the stationary readers, leading to considerable loss of data. However all numbers of observations have met our statistical criteria to calculate the indicators specified by the users.

<i>Objects identified in context</i>	<i>Number of valid observations</i>
Surgeries	178
Professionals, according to function	801
Patients	88
Materials	122
Blood products	141

Project in figures

Please note that the project included not only the pilots, but also two studies: “Inventory of RFID Applications and Lessons Learned” and “Standardization of RFID Technology”. These studies are included in the overall project budget.

	<i>Planned</i>	<i>Realised</i>
Project duration	July 2005 – July 2006	July 2005 – January 2007
Project budget	1.3 M€	Not disclosed, but higher
- of which subsidy	658 k€	To be determined