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RFID and IoT in Europe 2021

RFID for tracking Medical Devices at Tallaght University Hospital

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Introduction

- Who are we?
- Medical Device Management
- Identifying problem
- Creating the solutions (Phase 1 + 2)
- Proof of Concept and the Future

Who are we?

“Clinical Engineers are trained, and qualified medical engineering professionals required to design, evaluate, regulate, maintain and manage medical devices, and train on their safe use in health systems”

World Health Organisation: 2018

Tallaght University Hospital

- One of Ireland's largest academic teaching hospitals
- Approximately 3,500 staff / 58 nationalities
- 30+ Clinical services provided.
- 8,000+ Medical Devices

Clinical Engineering Department

- 11 Clinical Engineers
- 1x main department, 3x specialist workshops (ICU, Theatre, Dialysis Unit)
- Medical Equipment Library – central storage area & medical device loan service

Medical Device Management

- Procurement
- Education
- Maintenance & Repairs
- Quality Management
- Risk Management
- Research

Identifying the problem

- Clinical Engineering are limited in their ability to accurately track all MDT as they are often small, light and mobile
- An audit of the existing asset database in 2018 found that approximately 50% of assets were not located in their specified area
- There was a requirement for tracking assets more accurately

Identifying the solution

- Research into RFID technology showed that it can improve asset management in a healthcare setting

- Uptake of this technology has been slow in healthcare
  - large capital costs
  - undesirable ROI
  - technical complexity
  - staff training difficulties

- Can we develop simple, innovative and cost effective RFID system designed to play a vital role in the management of MDT?

Design & Implementation: Phase 1

The Medical Equipment Library (MEL) service was selected as the trial location because of:

1. The highly mobile nature of loan medical devices
2. Existing process for tracking MDT for comparative study
3. Hospital wide service providing multiple test environments

Design & Implementation: Phase 1

- The system hardware consists of:
  - 4G smartphone and handheld scanner,
  - RFID printer and RFID tags
  - Cloud-based software application (https://itemit.com/#).
  - Small investment

- Operates on a “last seen” principle

- Passive, scalable, cost-effective system as a proof of concept.

Design & Implementation: Phase 1

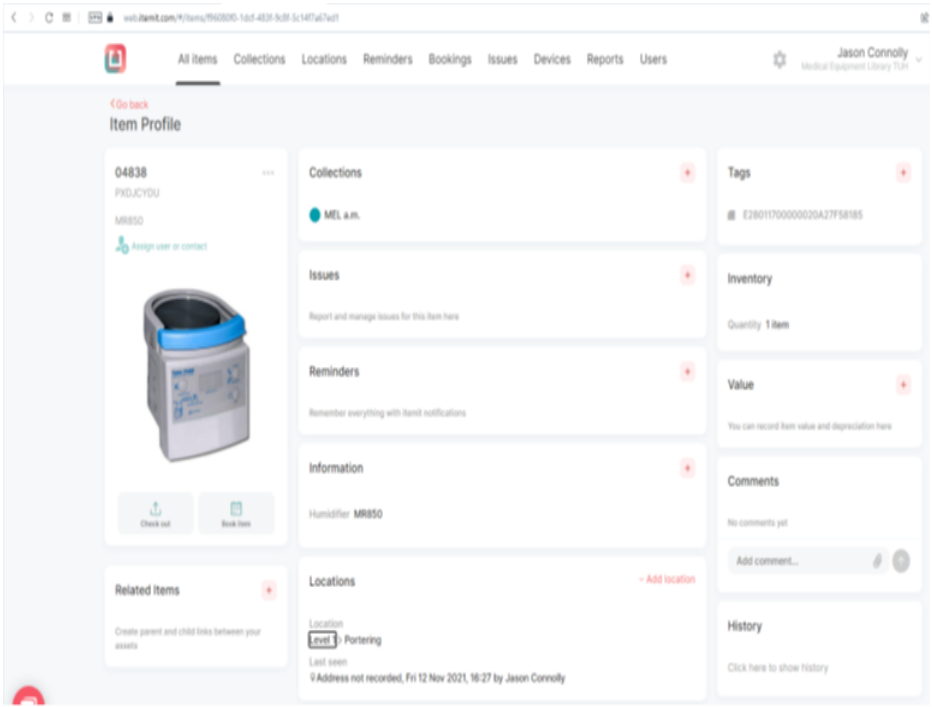
Database of medical devices in all clinic areas designed within the software.

Digital map of 50 locations over four floors.

Daily audits to update database with the movement of equipment to/from clinical areas.

The test system went live on 22/01/2020 as a test system.

Now used daily in the management of the MEL.



Results & Feedback

- Improved database accuracy from 52% to 80%
- Introduced notification function to quickly identify potentially faulty/hazardous devices
- Reduced infection control risk for patients & staff
- Streamlined data capture processes and reduced reliance on paper records

Design & Implementation: Phase 2

- Can we use Fixed RFID readers to automate a “last seen” database?
- Introduction of fixed readers.
- Integrate fixed readers with ItemIT software.

Design & Implementation: Phase 2

- New dialysis unit opened Oct 2020
- Eight zones over two floors
- April 2021 8x fixed RFID readers installed

Design & Implementation: Phase 2

Barriers to progress:

- WiFi network instability
- Technical knowledge
- Human Resources
- COVID-19

Next Steps:

- Wired LAN (~90% complete)
- Give nursing team access
- Prove the concept!

Future Developments

Successful implementation of Phase 2

Targeted expansion into clinical areas.

Integration of all clinical areas for whole hospital solution.

Other support services to utilise the system.

THANK YOU