Future proof architecture for Eurotransplant

OpenEHR day
20, 21 March Helsinki & Stockholm

Wouter Zanen
Program manager

Clinical Informatician
What is Eurotransplant

- Organ Exchange Organisation
- Optimal use of donor organs
- Registry
History

1967: foundation by Prof. Jon J. van Rood

Eurotransplant countries

- 1967: Netherlands, Belgium, Luxemburg
- 1970: Austria, West-Germany, Switzerland (left ET 1978)
- 1991: Eastern-Germany
- 1999: Slovenia
- 2007: Croatia
- 2013: Hungary
European organ exchange organizations
(per million inhabitants)

- Eurotransplant: 135.8
- UKTransplant: 62.9
- ABM France: 61.5
- CNT Italy: 56.9
- ONT Spain: 43.2
- Poltransplant: 38.2
- Scandiatransplant: 24.2
- NTA Romenia: 21
- Hellas NTO: 11
- Czech Transplant: 10.3
- OPT Portugal: 10
- SwissTransplant: 7.2
- Baltransplant: 7.1
ET Member States and TX-Programs

14,533 patients on the active organ waiting list on January 1, 2017
11,244 registrations on the waiting list in 2016
6,988 organ transplants from deceased donors in 2016
135,8 million inhabitants in the Eurotransplant region

More figures →
Liver Patient – female

- Female
- Slovenian
- 47 years old
- Primary Diagnosis: Autoimmune hepatitis
Follow-up

Waiting list management

Allocation
- Donor
- Matching
- Transplantation
The Why

Reasons for choosing an OpenEHR:

1. Semantics
2. Semantics
3. Semantics
4. Buy Before Build
5. Interoperability
Semantics – Waiting list management

Hospital system

Common data models

ET
Lung

OpenEHR Helsinki & Stockholm

28-3-2018
Semantics - Donor

Donor

- Netherlands

Common Archetypes / Use case specific Templates

Different

- Language
- Process
- Data
- Governance
Patients with hepatitis

Allocation
• Algoritme

Registry

Comittees / Research

Nat. Authorities

European Liver Registry

German Transplant Registry

Pediatric Transplant Registry

CTS

Studies / research

Share Semantics
Buy before Build

**IT strategy**

- Reduce operating costs
- Leverage innovation capacity of the vendor
- Increase standardisation
- Improve information Security
- Reduce lock-in
Interoperability

- Do we only need FHIR?
- Start with semantics
- Gateway to consolidate

Hospital system

Health Care Integration Engine

Healthcare integration models

CSV / File Upload

Rest

ET

Liver

Intestine

Pancreas

Kidney

Heart

Lung
Architecture

- Waiting list
- Donor
- Clinical Data
- Service BUS
- Business rules
- Kidney
- Liver
- Heart
- Oracle Middleware
- Oracle Middleware and Database
- Allocation
- Follow-up

Kidney Fup, Liver Fup, Heart Fup
Choice for OpenEHR

- (Future) Interoperability
  - Untangling process data from clinical data (non-process)
  - Semantics
    - Supporting multiple messages standards (rest, HL7v2, Fhir etc.)
    - Classifications (Snomed, ICD-10, LOINC etc.)

- Flexibility
  - Transplant data does not differ to much per country
    - Semantics do differ
  - Processes differ a lot per center/country
  - Governance differs per country
What we needed

Open Platform

1. Open Standards Based
2. Shared Common Information Models
3. Supporting Application Portability
4. Federatable
5. Vendor and Technology Neutral
6. Supporting Open Data
7. Providing Open APIs
8. Operability (as in DevOps)

* Apperta foundation white paper (apperta.org)
Marand

- Api’s (love them, but not open yet)
- Data extraction tool
- Operability
  - Zero downtime
- Continues improvements (upgraded 4 times so far)
  - Our wishes in the platform
- AQL query designer and Explorer
- Simple terminology adapter
- Information security
Implementation

- Partnerships
  - Marand (Technical support on the Think-EHR platform)
  - E-Curae (Project management, modeling support)
  - FreshEHR (Training, Reviews)
- Team:
  - 2 developers
  - 1.5 modeller
  - 0.2 project management
Implementation

- Modeling
  - Ocean informatics Template and Archetype designer
    - Moving to Marand designers.
  - After 2 months of modeling we were sufficiently trained to fly solo
    - Reviews from FreshEHR remain very valuable
  - Clinicians involved in modeling
  - Refactoring

- After 8 months: Live in Nijmegen our Pilot center
  - 3 templates
  - 3 terminologies inside ThinkEHR terminology adapter
Does it check the boxes

- Clinical driven, share-able data models
- Open standards
- Continues improvements OpenEHR
  - Open API
  - Case Management / work flow
- Continues improvements of the platform
Questions ?