Towards semantic interoperability of EHR systems
Lessons learned from the vendor experience

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Services will need to be reconfigured….
Content

UK (England) NHS Health Programme – progress so far
BT Health experience
Lessons learned from Vendor experience
English Programme – progress so far

Made up of 900 organisations and 40,000 independent contractors

- 90,000 doctors
- 500,000 nurses

4-5 years in to the programme
Already 4 years in…

1.2m employees have access to N3
  29 730 connections to N3
  100% of GP practices connected
7 963 113 bookings made on Choose and Book
77 427 445 electronic prescription messages (approx 17% daily prescriptions)
All NHS hospitals in England using PACS
GP2GP has now been used for 108,334 medical record transfers
NHS Care Records Service

153,188 Summary Care Records have now been uploaded to the Spine.

There are 469,856 Smartcard holders who are registered and approved for access to the Spine.
BT Health experience
NPfIT – Who’s doing what

National Services

Electronic Booking

NHS Care Record Service
Electronic Transfer of Prescriptions
Secondary Uses Service
Quality Management and Analysis System
New National Network

NHS eMail (NHSMail)

Local services

CSC

NME

Fujitsu

Southern

London
London LSP technical architecture
Gateway to the National Care Record

- Registration and Authentication
- Multichannel Access – Digital TV, Kiosks, Mobiles
- Electronic Transfer of Prescriptions (ETP)
- NHS Care Record service
Vendor experience
“Modernising” Health Services require

Clinicians to be aided / prompted by decision support and guidance…. **better clinical safety**

Care of patients based on best evidence and integrated care pathways

Reuse of clinical information to inform research and health service developments and priorities

Interchangeable and multi-competent skill sets in clinicians

Multidisciplinary team working across traditional boundaries of care, e.g:

- Nurses visit patients with chronic diseases in their homes
- Commercial optometrists do regular diabetic checks in an integrated care programme
- Hospital departments responsible to community care leads

Patient is the focus not the institution
The case for semantic interoperability

- Clinicians to be aided / prompted by decision support and guidance….*better clinical safety*
- Care of patients based on best evidence and integrated care pathways….*better quality care*
- Reuse of clinical information to inform research and health service developments and priorities….*maximising the information assets*
Minimal Organisational artefacts for enterprise interoperability – Clinical view

**Logical Data Model**

**ARCHITECTURE**  **TERMINOLOGY**

**ARCHETYPES**  **TERMININFO**

**CLINICAL CONTENT**

*Information Models*
Standards and interoperability

- Messaging Model (HL7 v3)
- Terminology Model (SCT)
- Information Model (openEHR, HL7 v3 RIM)

- HL7 CDA
- EHR extracts (CEN13606)
Observations from the BT integration space (semantic integration perspective)

• Terminology is *large* and *complex* and a *work in progress*
  • Full utilisation of the functionality is a long term goal
  • We must proceed in close cooperation with terminology services (global/national/regional)
  • We require artefacts which should be the IP of the health organisation or the state (or humanity)
  • We should choose high value delivery domains and collaboratively deliver value quickly – *detailed end to end use case led approach*
    • Vaccination
    • ADR
    • Medication concepts
    • Non-drug allergy
  • At this time vendors need detail
Post-coordination

• is still a research project
  • ALL our suppliers find it challenging
  • We need to provide “work arounds”
  • Need to research complex topics such as natural language generation from complex post-coordinated expressions

• Need to focus on the pragmatically do-able
  • Laterality
  • Family history
  • Surgical approach
  • Location
Work on clinical content models

• Useful collaborative work is going on in the UK
• Another huge and complex problem
  • How to decide and agree on the use of Terminology and the use of free text and other constructs
  • How to define detailed clinical models in our work
  • The place for reference and interface terminologies
  • Must be tackled from an enterprise wide information storage approach
    • Collect – store locally – share appropriately – store nationally – reuse appropriately
    • Do not try to code things which we don’t need to retrieve
    • Don’t try to solve the detailed clinical model problem until we can crawl then walk
Other big issues

Cross border working needs common drug dictionaries
Health and Pharma live in 2 parallel universes -- and shouldn’t!
Do we need to research common health information storeage ontologies for reuse of health information?
Have we a sufficient, sufficiently well trained, pool of health informaticians?
We must move towards more agile and more collaborative design