NHS

National Institute for Health Research

Using i2b2 in cardiovascular cohort discovery and beyond:

BRICCS and BRISSkit

Nick Holden, Systems and Database Architect, LCBRU

Richard Bramley, Clinical Data Integration Developer, LCBRU

Shajid Issa, Technical Consultant, BRISSkit Project

Using i2b2 in cardiovascular cohort discovery and beyond:
BRICCS and BRISSkit

> *To implement a platform of easy-to-use and appropriately integrated software for translational research by the Cardiovascular research team (BRICCS) and everyone else (BRISSkit).*

Nick Holden, Systems and Database Architect, LCBRU

NIHR Leicester Cardiovascular BRU

- *"At the heart of research"*

➤ Funded since 2009 by the National Institute for Health Research (NIHR).

➤ A partnership between the University Hospitals of Leicester NHS Trust and the University of Leicester.

➤ Two translational themes: genetics and novel therapeutic interventions.

➤ Cross-cutting core theme of informatics support

➤ A new building, and participation in a national NIHR BioResource.

BRICCS

The Biomedical Research Informatics Centre for Cardiovascular Science

- ➢ BRICCS is both a research project and an informatics strategy.

- ➢ A suite of open source software solutions for translational research.

- ➢ Acquired from disparate sources; customised, configured, integrated and enhanced by in-house development.

- ➢ Covering contact relationship management, electronic data collection, cohort discovery, clinical data integration, biospecimen inventory and workflow recording, identity protection.

BRICCS
The BRICCS components

- ObiBa Onyx – data collection, participant interview

- I2b2 – Cohort discovery, clinical data integration

- REDCap – Questionnaire design, data collection, surveys

- CaTissue – Biological sample processing and inventory

- CiviCRM – the 'front door', contact relationship management

   Utilities: Drupal portal, wiki, ID and barcode generation

Why open source?
Software can be complex, expensive, limiting

➢ Proprietary software development relies on the developer convincing the user that they want the same feature set as everyone else. Which equates to the feature set that the developer wants to provide.

➢ Providing data for research requires software that is flexible, scalable and customisable – yet also works to encourage collaboration and data sharing.

➢ So does clinical delivery.

➢ Which goes first?

➢ Does it matter?

Left foot

| Left foot | Right foot |
| Left foot | Right |

BRISSKit
Biomedical Research Infrastructure Software Service Kit

- Cloud-enabled, software-as-a-service toolkit for translational research.

- Managed deployment under development for NHS / academic institutions.

- Based on BRICCS development work, but with greater scope.

- Initially project funded by JISC, now developing a sustainability model.

http://www.brisskit.le.ac.uk

Using i2b2 in cardiovascular cohort discovery and beyond:
BRICCS

Progress, experiences, plans and challenges in delivering i2b2 as a translational platform in the absence of a comprehensive Electronic Health Record system

Richard Bramley, Clinical Data Integration Developer, LCBRU

BRICCS
The current i2b2 situation

➢ Over 3,000 recruits, 1.5 million data elements.

➢ Clinical data from questionnaire, hospital pathology system and an array of audit databases.

➢ Cohorts identified for 10 supplementary studies in various stages.

BRICCS
Future plans for i2b2

➢ Extend existing data sources: modifiers, enhanced scope and range.

➢ Additional data sources: prescribing, imaging, primary care data.

➢ Incorporate genomic and other 'omics data.

BRICCS
Current challenges

> Our hospital has no unifying Electronic Health Record system.

> Extracting information / meaning from data, semantics.

> Encounters and episodes and start dates.

> Duplicated data.

> Creating a usable ontology.

BRISSkit
Translational Research Software as a Service

Mature open source applications for:

- Patient recruitment and consent management

- Questionnaire Data Capture

- Tissue sample inventory and management

- Clinical research analytics

- Clinical integration

BRISSkit
Translational Research Software as a Service

Software as a Service approach:

➤ More efficient and easier for researchers

➤ Offers significant savings in research database and IT support costs

➤ Facilitates data sharing within and between institutions

➤ Rapid flexibility, scalability and ubiquitous access

➤ High levels of security and compartmentalisation

Example BRISSkit Implementation
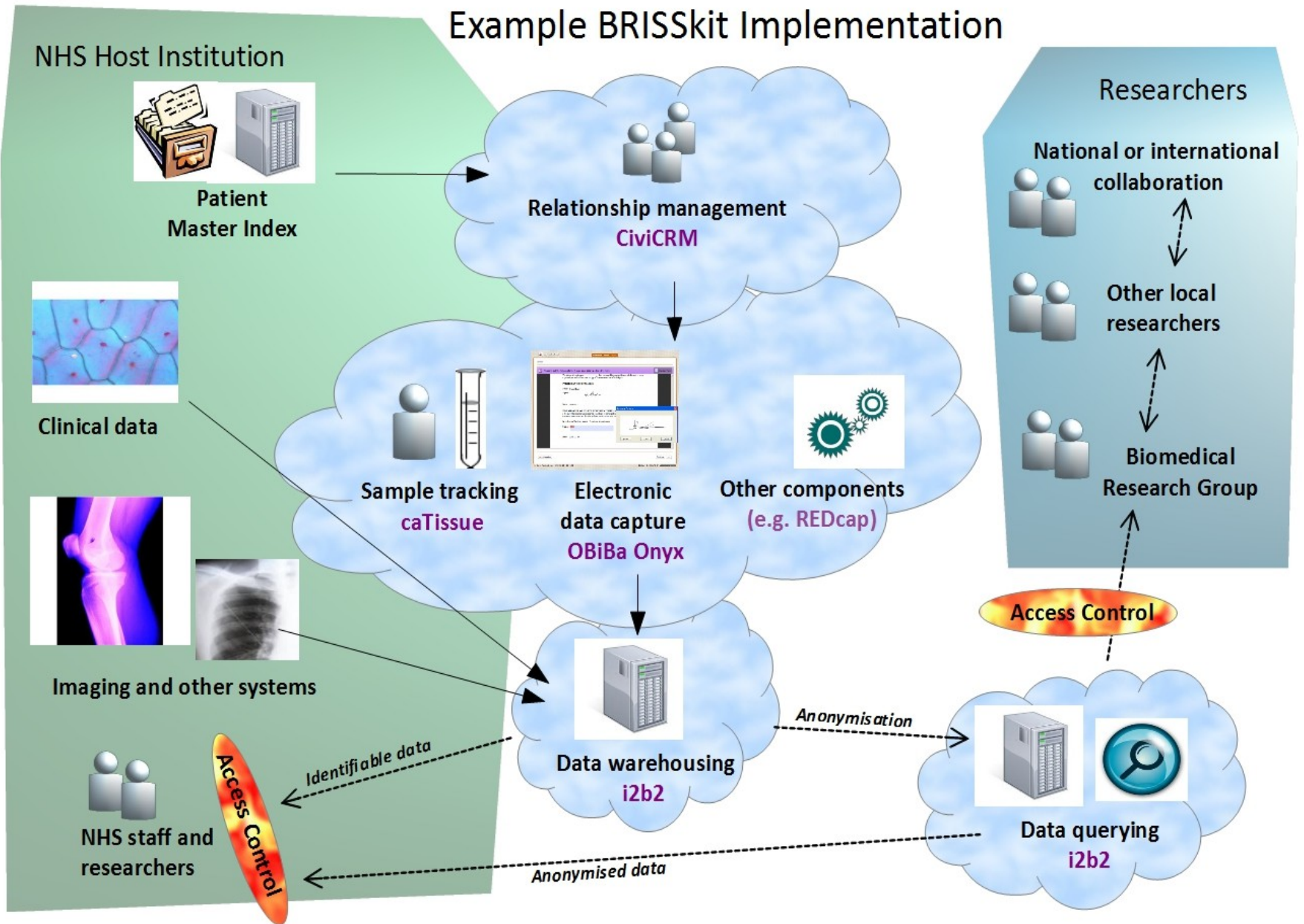
BRISSkit

Demonstration of incremental data delivery

BRICCS and BRISSkit
 – any questions?