

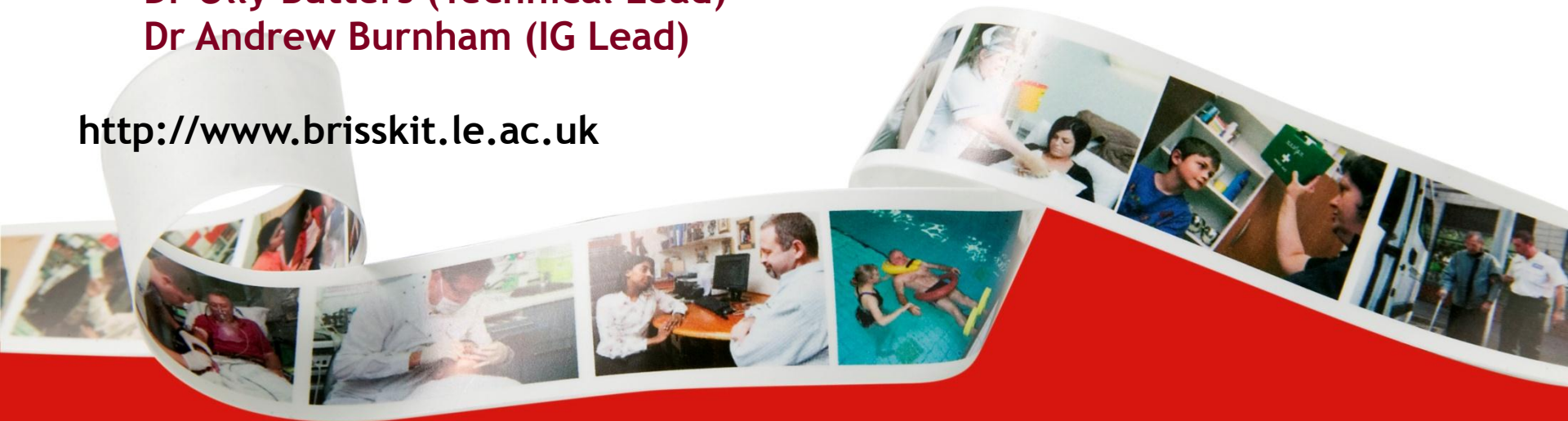
BRISKit:

Biomedical Research Infrastructure Software Service Kit

A vision for cloud-based open source research applications
#BRISKit

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<http://www.brisshit.le.ac.uk>

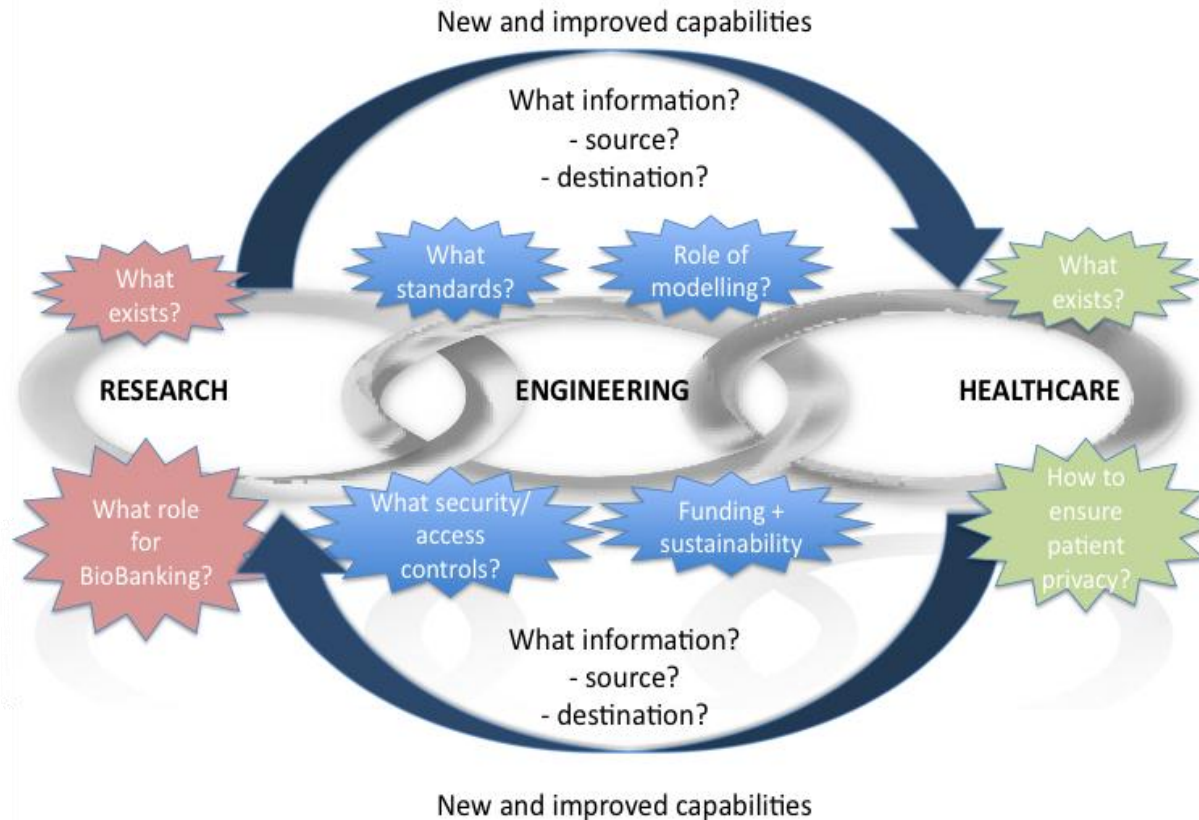


BRISKit context:

The I4Health goal of applying knowledge engineering to close the 'ICT gap' between research and healthcare (Beck, T. et al 2012)

Data as a public good & research efficiencies

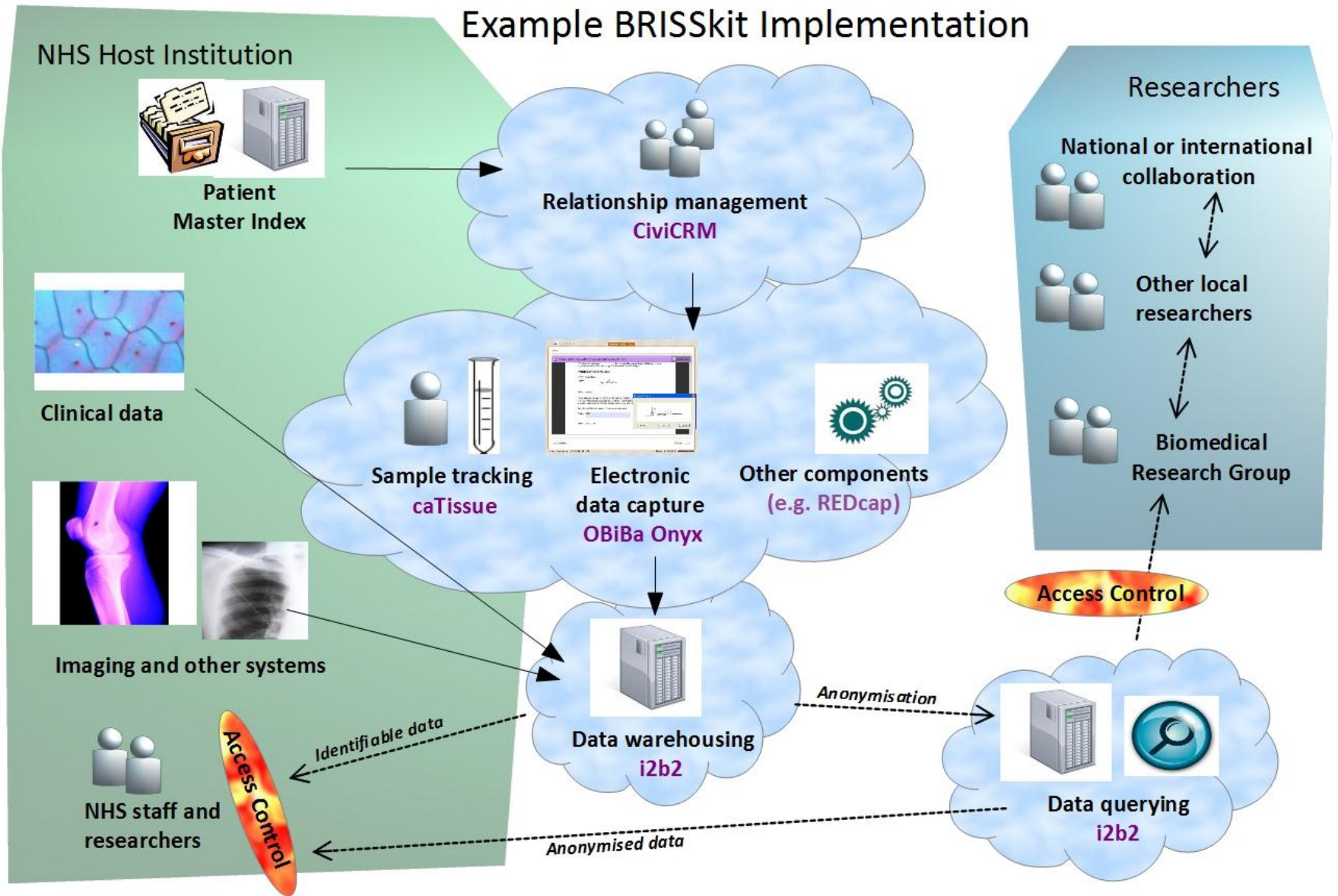
= strategic priority for government, NHS, funders (e.g. MRC, Wellcome, CRUK)



Overview of BRISKit

- Developing “software as a service” data management infrastructure based on open-source applications
- More efficient & easier for researchers
- Offers significant savings in research database and IT support costs
- Development funded by HEFCE
- University of Leicester in partnership with the University Hospitals Leicester Trust and the Cardiovascular BRU

Example BRISKit Implementation



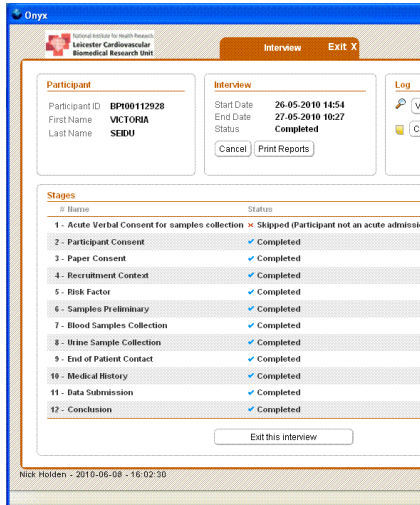
BRISKit USPs

- Integrated support for core research processes
- Well-established mature open source applications as prototyped in Cardiovascular: fully UK customised
- A platform for seamless management and integration between applications
- An API allows integration with existing clinical systems
- Easy set up, use and administration through browser (including on mobile devices)
- Capability of being hosted in any compliant cloud provider including UHL (NHS information governance)

Research: the semantic bridge

OBiBa Onyx

Records participant consent, questionnaire data and primary specimen IDs

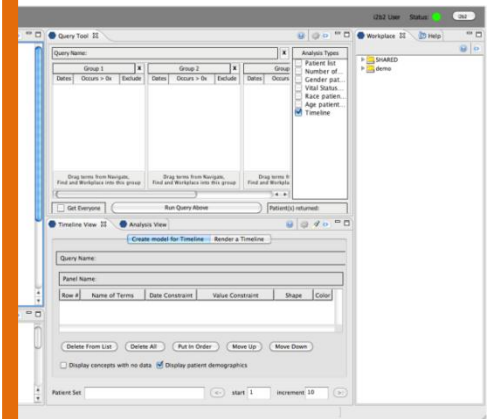


Bio-ontology!

- Classes
 - BrissKitQuestionnaire
 - RiskFactorAlcohol
 - RiskFactorCigars
 - RiskFactorCigs
 - RiskFactorDietExercise
 - RiskFactorFamilyHistory
 - RiskFactorOtherTobacco
 - RiskFactorSocioeconomic
 - RiskFactorTobacco
 - HPO
 - All
 - Phenotypic abnormality
 - Abnormality of the cardiovascular system
 - Abnormality of the hematopoietic system
 - ICD10
 - Diseases of the circulatory system
 - Diseases of the skin and subcutaneous tissue
 - Factors influencing health status and contact with health services
 - Persons encountering health services in other circumstances
 - LOINC
 - LOINCCLASSTYPES
 - Clinical Class
 - Functional status (e.g. Glasgow)
 - Gastrointestinal endoscopy
 - Medical Devices
 - SNOMED-CT
 - Clinical finding
 - Functional finding
 - Hepatorrhaphy
 - Observable entity
 - Organism
 - Social and personal history finding
 - Substance
 - Tobacco smoking behavior - finding
 - Tobacco use and exposure - finding

2

port selection and querying



Who is BRISKit for?

Modular approaches and scalable tools with open source licenses make good investments

- *Individual researchers and associates*
 - enterprise-level tools without the IT overheads
- *Research themes and departments*
 - stand-alone instances of required tools to accelerate research
- *Research units and centres*
 - integrated toolkit with clinical data loading services, or 'jigsaw pieces' to complement existing provision

BRISKit Community & Hack Event, Oct 2012

<http://www.brisshit.le.ac.uk/node/35>



BRISKit Community & Hack Event

- <http://www.brisshit.le.ac.uk/node/35>
- created ideas pre and post event via [healthresearchhack](#) google group
- 6 hack solutions in 2 days using BRISKit stack, e.g.
 - i2b2 integration using demo data from HES and cancer research clinical trials data (UCL, Birmingham, Goettingen, Leicester)
 - smartphone app to scan v.tiny barcodes from the end of sample vials and import info into caTissue
 - integrate CiviCRM study management and REDCap questionnaire tool (UHL Respiratory BRU)
 - create a simple CiviCRM study creator as a Drupal plugin

BRISKit Information Governance & Security Management Work Stream

1. **Information Governance Toolkit** - analysis of Department of Health (DoH/NHS) IGT requirements vs. BRISKit organisation/project and services/tools
 - a) Hosted Secondary Use Team/project ([Hosted IGT](#))
 - b) Acute Trust ([Acute Trust IGT](#))

IGT – Hosted Secondary Use Team/Project

Hosted Secondary Use Teams/Project (HSUT/P)

- For individuals, teams and their projects that process NHS patient information for the purposes of non-direct care e.g. clinical research activities and other related patient data analysis (public health planning).
- These individuals / teams are effectively discrete sub-units or divisions of their host organisation whose overall business interests may span a range of clinical and non-clinical activities e.g. universities, Public Health Teams hosted/employed by Local Authorities, commercial organisations.
- This requirement set enables such individuals / teams to assess the adequacy of IG processes around their projects.

Req No	Description
Information Governance Management	
10-120	Responsibility for Information Governance has been assigned to an appropriate member, or members, of staff
10-121	There is an information governance policy that addresses the overall requirements of information governance
10-122	All contracts (staff, contractor and third party) contain clauses that clearly identify information governance responsibilities.
10-123	All staff members are provided with appropriate training on information governance requirements.
Confidentiality and Data Protection Assurance	
10-220	Personal information is only used in ways that do not directly contribute to the delivery of care services where there is a lawful basis to do so and objections to the disclosure of confidential personal information are appropriately respected
10-221	There are appropriate confidentiality audit procedures to monitor access to confidential personal information
10-222	All person identifiable data processed outside of the UK complies with the Data Protection Act 1998 and Department of Health guidelines
10-223	All transfers of personal and sensitive information are conducted in a secure and confidential manner
Information Security Assurance	
10-330	Policy and procedures ensure that mobile computing and teleworking are secure
10-331	There is an information asset register that includes all key information, software, hardware and services
10-332	Unauthorised access to the premises, equipment, records and other assets is prevented
10-333	There are documented incident management and reporting procedures
10-334	The confidentiality of service user information is protected through use of pseudonymisation and anonymisation techniques where appropriate
10-335	There are adequate safeguards in place to ensure that all patient/client information is collected and used within a secure data processing environment (safe haven) distinct from other areas of organisational activity.

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 - b) Acute Trust ([Acute Trust IGT](#))
2. **IG Training Tool** (NHS – University is registered)
3. **Pseudonymisation** requirements
4. **Data Management Plan**
5. **IT Security & standards** – Penetration Testing & Security Testing
6. **Other NHS Standards/Requirements:**
 - Care Records Guarantee
 - NHS Constitution
 - NHS Records Management
 - Patient Safety DSCN 14/2009, 18/2009

BRISKit Information Governance & Security Management Work Stream

Security Management – ISO27001 / ISO27002

- Consideration of accreditation (see UCL)
- Implementation of an Information Security Management System (ISMS)
- Risk Identification, Assessment and Management
- Implementation of Information Security Policy/ISMS Policy
- Implementation of information Asset Ownership (Risk Assessment, Assurance Reporting, System Level Security Policy)
- Security controls to protect information assets
- Roles, responsibilities, training and competence
- ISO27002 – 138 controls
- Liaison with Pilot sites (UCL) re ISO27001 requirements and accreditation
- Review of ISO27001 for implications for services/tools offered
- Review of ISO27001 for implications for the organisation offering BRISKit services

www.brisskit.le.ac.uk

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BRISSkit - Biomedical Research Infrastructure Software Service kit

Overview

BRISSkit will design a national shared service brokered by JANET to host, implement and deploy biomedical research database applications that support the management and integration of tissue samples with clinical data and electronic patient records. We are uniquely positioned to tackle this through our experience in developing the pioneering open source IT infrastructure for the Biomedical Research Informatics Centre for

JONATHAN TEDDS

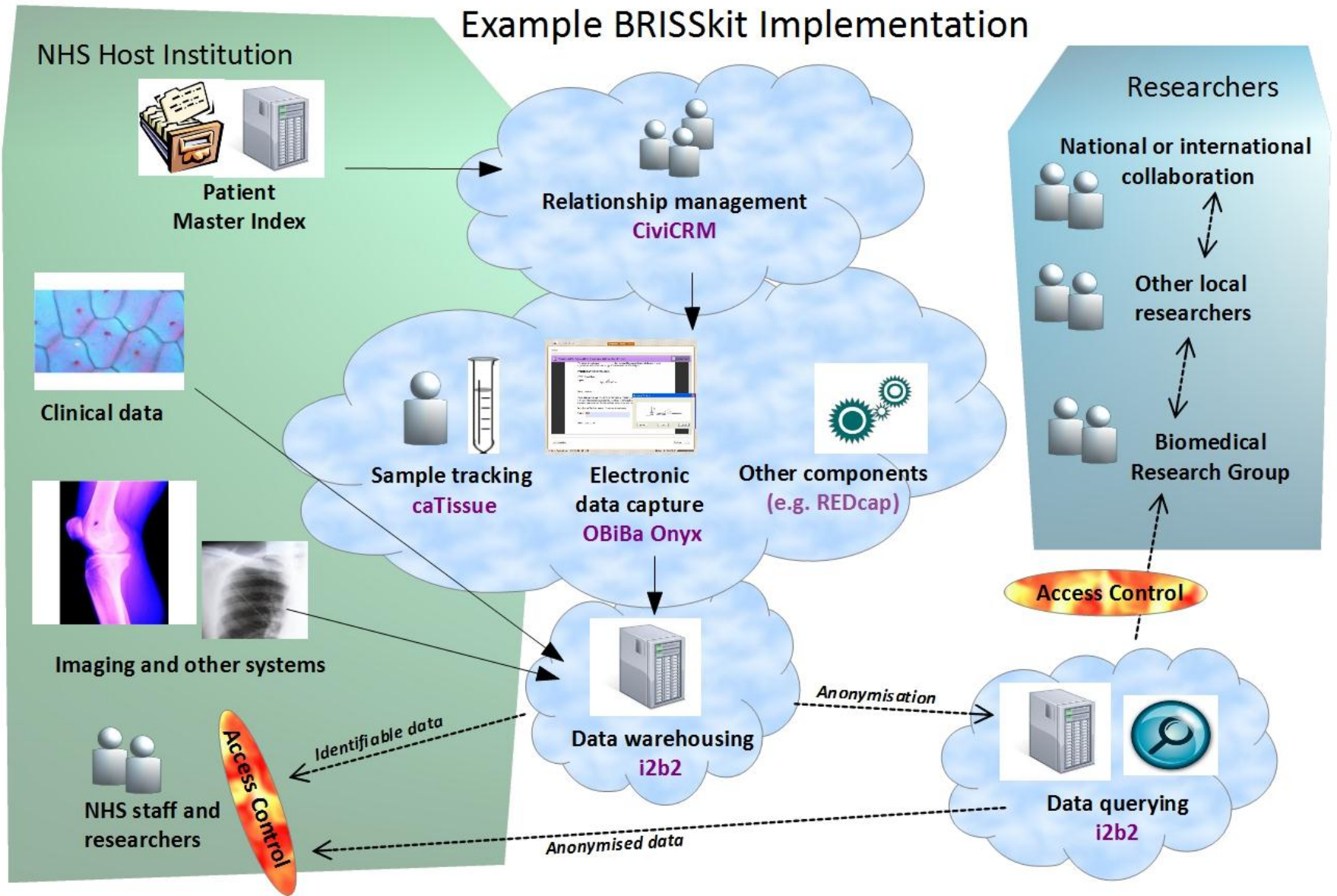
- [My account](#)
- ▶ [Create content](#)
- [Log out](#)

RECENT BLOG POSTS

- [CiviCRM](#)
- [Advances in Medical Sciences](#)

DEMO

Example BRISKit Implementation



BRISStkit components = web services

CiviCRM

Enables end-to-end contact management for volunteers and research participants, tracking approaches, contact, responses, recruitment, exclusions.

CiviCRM was designed for the 'civic sector' and has an object model that reflects community building and non-profit relationships.

The screenshot displays the CiviCRM 3.1 Demo Site interface. The top navigation bar includes the CiviCRM logo and the text "CiviCRM 3.1 Demo Site". Below the navigation bar, the main content area is divided into several sections:

- 最近項目 (Recent Items):** A list of recent items, currently showing "dan rol".
- 新個人 (New Person):** A form for adding a new person, with fields for name, surname, and email address.
- 我的聯絡人總覽 (My Contact Summary):** A section for managing contacts, currently showing "demo".
- 即將舉行的活動 (Upcoming Events):** A list of upcoming events, currently showing "test" on "May 31st, 2010".
- Activities:** A table listing activities, including a "Meeting" and "Recibido correo".
- Event Income Report (Summary):** A pie chart titled "Event Summary" showing the distribution of income from various events: "Rain-forest ..(3)", "test..(7)", "Fall Fundrai.", and "Summer Solst..(2)".
- Top Donors Report:** A table showing the top donors, currently empty.
- Membership Report (Summary):** A table showing the membership report summary, including columns for Month Beginning, Membership Type, Member Count, Total Payments Made, Contribution Count, and Average.

Month Beginning	Membership Type	Member Count	Total Payments Made	Contribution Count	Average
February 2009	General	3	\$ 0.00	0	\$ 0.00
February 2009	Student	1	\$ 0.00	0	\$ 0.00
	SubTotal	4	\$ 0.00	0	\$ 0.00
Subtotal		4	\$ 0.00	0	\$ 0.00
January 2010	General	2	\$ 0.00	0	\$ 0.00
January 2010	Student	2	\$ 0.00	0	\$ 0.00
	SubTotal	4	\$ 0.00	0	\$ 0.00
February 2010	General	9	\$ 0.00	0	\$ 0.00
February 2010	Student	11	\$ 0.00	0	\$ 0.00
February 2010	Lifetime	2	\$ 0.00	0	\$ 0.00
	SubTotal	22	\$ 0.00	0	\$ 0.00
May 2010	Mem Org	1	\$ 0.00	0	\$ 0.00
May 2010	Mem Org 2	1	\$ 0.00	0	\$ 0.00
	SubTotal	2	\$ 0.00	0	\$ 0.00
Subtotal		28	\$ 0.00	0	\$ 0.00
Grand Total		32	\$ 0.00	0	\$ 0.00

OBiBa Onyx

Records participant consent, questionnaire data and primary specimen IDs.

Web-based, secure data entry by research staff. E.g. used for all patient recruits in LCBRU - mobile computing on wards and outpatient clinic in TMF.

Await significant new release...

The screenshot shows the OBiBa Onyx web application interface. At the top, there is a blue header with the 'Onyx' logo and window controls. Below the header, the 'National Institute for Health Research Leicester Cardiovascular Biomedical Research Unit' logo is visible. The main content area is divided into several sections:

- Participant:** Displays fields for Participant ID (BPt00112928), First Name (VICTORIA), and Last Name (SEIDU).
- Interview:** Displays Start Date (26-05-2010 14:54), End Date (27-05-2010 10:27), and Status (Completed). It includes buttons for 'Cancel' and 'Print Reports'.
- Log:** Includes a 'View' button and a 'Comments (2) Add' button.
- Stages:** A table listing the interview stages with their status and timing.

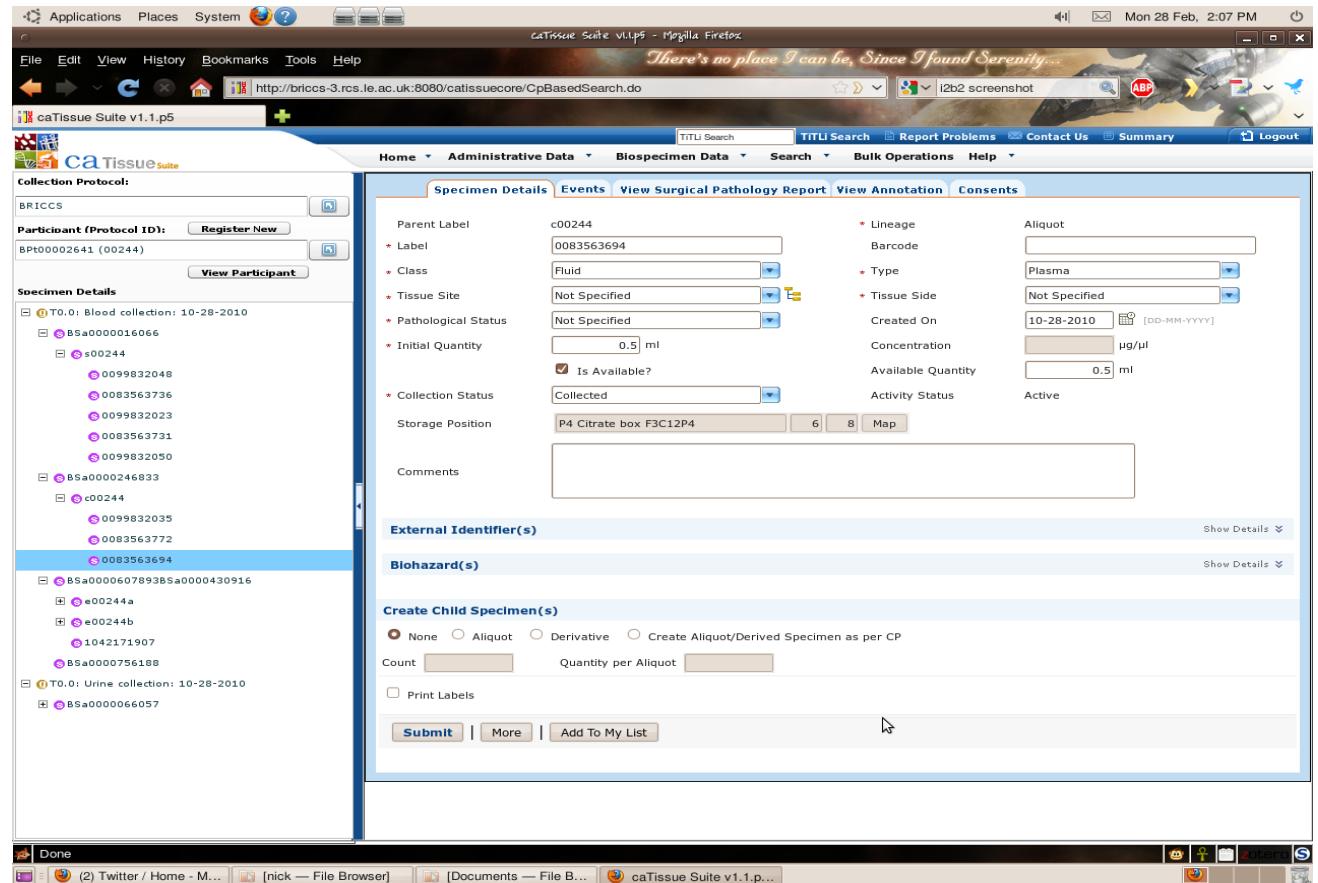
#	Name	Status	Start	End	Log
1	Acute Verbal Consent for samples collection	Skipped (Participant not an acute admission)	14:55	14:55	
2	Participant Consent	Completed	14:56	15:02	
3	Paper Consent	Completed	15:02	15:03	
4	Recruitment Context	Completed	15:06	15:06	
5	Risk Factor	Completed	15:07	15:16	
6	Samples Preliminary	Completed	15:16	15:18	
7	Blood Samples Collection	Completed	15:19	15:30	
8	Urine Sample Collection	Completed	16:07	16:07	
9	End of Patient Contact	Completed	15:31	15:32	
10	Medical History	Completed	15:32	15:59	
11	Data Submission	Completed	15:59	16:06	
12	Conclusion	Completed	10:26	10:27	

At the bottom of the interface, there is a timestamp 'Nick Holden - 2010-06-08 - 16:02:30' and the version number 'OBiBa / 1.7.0-b6944e'. A button labeled 'Exit this interview' is also present.

caTissue

Holds data on primary, derived and aliquot specimen, including linear and 2d barcodes.

Storage inventory, order tracking - currently over 30,000 LCBRU samples stored and recorded.



i2b2

Data from multiple data sources combined into multiple ontologies for flexible and sophisticated searching, cohort discovery and research.

The screenshot displays the i2b2 Workbench interface. The top-left pane shows a tree view of the 'Onyx Ontology' with various data sources like 'BloodSamplesCollection' and 'MedicalHistoryQuestionnaire'. The top-right pane is the 'Export Data' dialog, with the 'Export Tables' tab selected. It offers options such as 'Return concepts within obs. set', 'Patient Mapping', and 'Return patient mappings within obs. set'. A progress bar at the bottom of this pane indicates 'Export complete'. The bottom-left pane shows 'Previous Queries' with a list of search results, including 'Type2 30-79 NoAF Y@05:43:13 [03-02-2012] [demo]'. The bottom-right pane is the 'Analysis View', which contains a 'Graphic Analyses' section and a bar chart titled 'Age patient breakdown'. The chart shows the distribution of patients across age groups, with the highest frequency in the 60-69 age range.

Age Group	Number of Patients
0 to 9	0
10 to 19	0
20 to 29	0
30 to 39	0
40 to 49	10
50 to 59	40
60 to 69	60
70 to 79	40
80 to 89	0
90 to 99	0
100 to 109	0
110 to 119	0