ETH zürich

Scientific IT Services (SIS)

ELN-LIMS Project
Electronic Lab Notebook (ELN)
Lab Information management system (LIMS)

Agenda

- Overview of SIS.

- Data & Workflow Management with openBIS.

- openBIS for ELN-LIMS project.

- Conclusions.

- Questions.

Scientific IT Services

High Performance Computing

- Operation of HPC clusters (Brutus and Euler)
- Provisioning and maintenance of scientific software on the clusters
- Support for researchers with HPC, e.g. by code optimization

Scientific Software and Data Management

- Offering „Code Clinics"
- Device and system integration
- Writing code for data mgt., workflows and visualization

Research Informatics

- Support for data analysis, visualization and publication
- Development and integration of workflows
- Data mgt. and workflow solutions

Consulting and Training

- Consulting for planning hardware, software and databases for research projects, groups and facilities
- Introduction into scientific software packages
- Community building on specific scientific software to increase information exchange and provide help so scientists can help themselves

People

High Performance Computing

- *Olivier Byrde (Group Head)*
- *Steven Armstrong*
- *Christian Bolliger*
- *Urban Borstnik*
- *Samuel Fux*
- *Eric Müller*
- *Allen Neeser*
- *Christiane Pousa Ribeiro*

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- *Bela Hullar*
- *Piotr Kupczyk*
- *Antti Olavi Luomi*
- *Emanuel Schmid*
- *Jakub Straszewski*
- *Uwe Schmitt*

Research Informatics

- *Thomas Wüst (Group Head)*
- *Caterina Barillari*
- *Lorenz Blum*
- *Manuel Kohler*
- *Henry Lütcke*
- *Michal Okoniewski*
- *Rok Roskar*

Data & Workflow Management

- SIS provides solutions for data management and workflow management based on openBIS.

openBIS

- openBIS is a data management platform for storing and organizing biological data.

- It was developed by C-ISD and its development is now continuously ongoing at SSDM within SIS.

- In openBIS, data can be annotated, tracked and shared throughout distributed research projects.

- It supports multiple technologies, such as NGS, screening, microscopy, proteomics, metabolomics.

openBIS
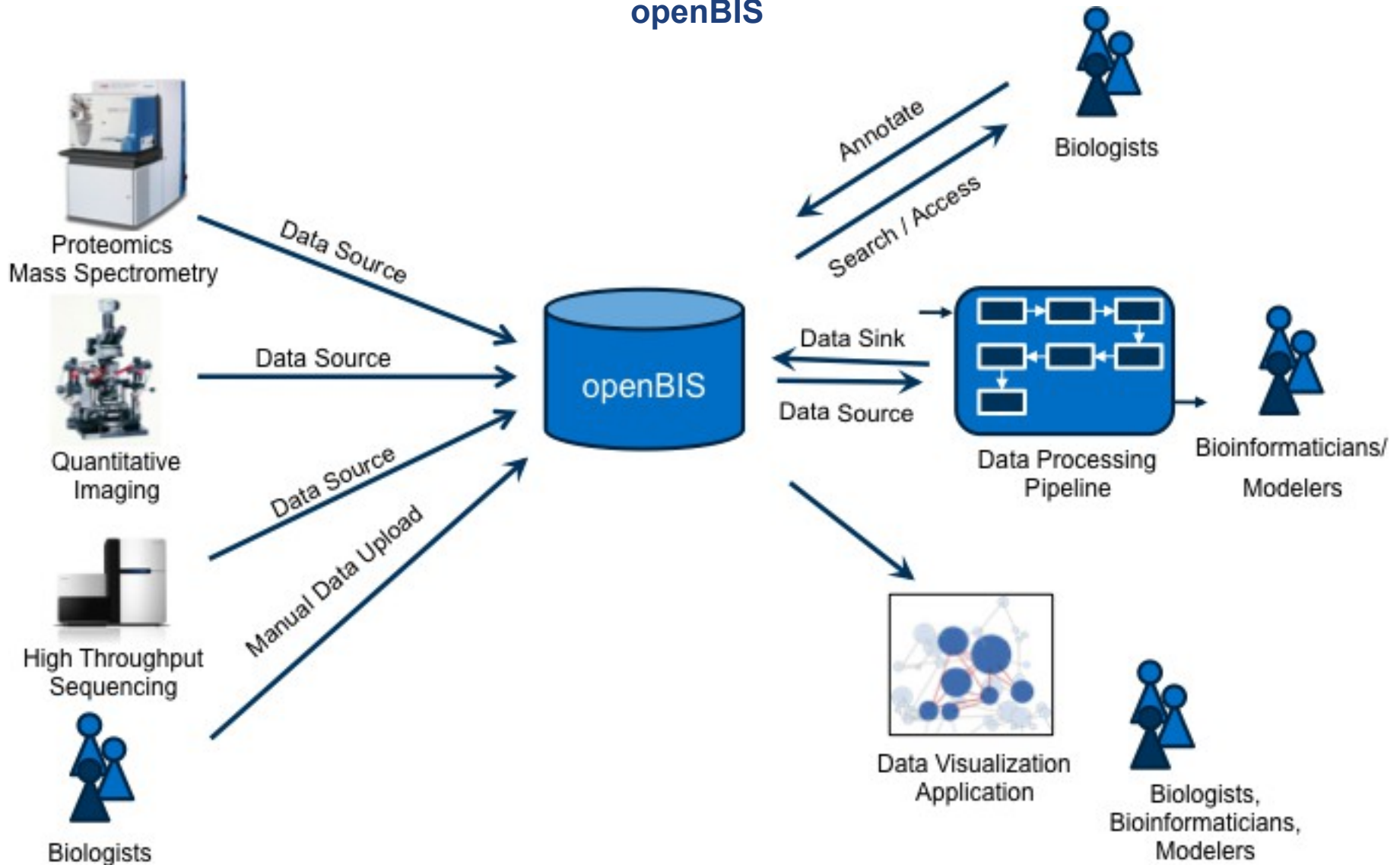
openBIS for ELN-LIMS

- openBIS allows scientists to:

  - Store all materials and protocols in an inventory.

  - Track all experiments done in one lab.

  - Link experiments to inventory.

  - Store all data produced in the experiment + metadata.

  - Store all analysis data + analysis scripts and track provenance.

  - Access and navigate data after several years.

  - Create custom views and plugins to manage the data.

openBIS for ELN-LIMS

- Main drawbacks of using openBIS mentioned by the users:

  - Powerful but complex user interface. Too many options.

  - The interfaces don't match directly laboratory workflows.

  - Laboratory specific extensions on the core user interface can be time consuming to build due to the technology stack.

openBIS for ELN-LIMS

- Laboratories Involved:

  - Stelling Lab (BSSE)

  - Peter Lab (ETH)

  - Krek Lab (ETH)

  - Stoffel Lab (ETH)

  - Bodenmiller Lab (UNI Zurich)

openBIS for ELN-LIMS

- Solutions:

  - New, simple but extendable HTML5 Interface, build as a web app plugin for openBIS.

  - The interface is build from the ground up to help with ELN-LIMS workflows.

  - Laboratory specific extensions and configuration is written in plain HTML+Javascript.

  - The interface works with any HTML5 enable device, including tables.

openBIS for ELN-LIMS

- LIMS Demo:

  - Inventory navigation.

  - Inventory metadata visualization: Table, tree View.

  - Inventory metadata management: Form create/update, update, batch creation from .xls or .csv file.

  - Search.

  - Data Upload and Visualization.

  - Parent / Children relationships and annotations.

  - Visual storage management.

  - Duplicate entities.

openBIS for ELN-LIMS

- ELN Demo, the sub experiments are managed very similarly to the inventory entities with a few additions:

  - Different navigation Space/Project/Experiment/SubExperiment.

  - Project, Experiment metadata views.

  - Spaces, projects and Experiments can't be created by ELN users. Are currently created by the admin.

  - Sub Experiment Children can be auto generated.

Conclusions

- Close to be production ready and is stable enough for test usage on the laboratory.

- The plugin is in heavy development currently, expect some interfaces changes and new features added every couple of weeks.

- Due to the level of interest and adoption looks like a viable alternative to commercial systems.

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