LabKey User Conference 2019

LabKey
Product Update

October 3, 2019

Community Investments: Process

Subversion → Git migration

- One metric: in the last year, 98% of the Java code in LabKey SVN repo has been moved to Git
- Why? Improved code quality & reliability, faster iteration, smaller & more flexible dev environment
- Feature branch workflow isolates changes. Every change is developed, reviewed, and tested on a feature branch before merging. Features branches can live for minutes, days, weeks, or months.

Scrum → Kanban

- Why? Faster iteration on enhancements, more transparency
- Continuous improvement, smaller stories, requests can move to board immediately

Unversioned patch releases → Official maintenance releases (e.g., 19.2.5)

- Scheduled, numbered, documented with release notes & lists of fixes
- Why? Predictability, improved transparency and support, faster delivery of certain features
- MATLAB Integration (19.2.1), Secure ODBC (19.2.4), File Watchers for Script-Based Pipelines (19.2.5)

LabKey Server Community Edition

- Charting: multiple axes, split plots, layout options, participant charts
- Sample set improvements: creation & import UI, performance, reliability
- Filtered lookups: filter lookup drop-downs during insert or update operations
- New SQL aggregate functions: median, standard deviation, variance, et al
- Domain API: infer, create, update dataset/list structures via Python & R
- WebDAV support in Rlabkey
- Security: CSRF protection, HTML filtering, whitelist external redirects
- Performance improvements via caching virtual schema metadata
- Support for OpenJDK 12/13, PostgreSQL 12.x, SQL Server 2019
- New ReactJS-based field designer!

Results Properties (7)

Search Fields

	Field Name	Data Type	Required?	Details
	Sample ID	Text (String)	☐	⊞
	cultureDay	Integer	☐	⊞
	Sample Description	Text (String)	☐	⊞
	Inj Vol	Lookup	☐	**Remove Field** Advanced Settings ✕

Lookup Definition Options

From Folder
Current Folder

From Schema
lists

Target Table
Test (Integer)

Name and Linking Options

Description
Add a description

Label

Import Aliases ❓

URL ❓

Results Properties (7)

Search Fields

Field Name

Sample ID

cultureDay

Sample Description

Inj Vol

Advanced Settings and Properties for Inj Vol ✕

Display Options

These options configure how and in which views this field will be visible.

☑ Show field on default view of the grid
☑ Show on update form when updating a single row of data
☑ Show on insert form when updating a single row of data
☑ Show on details page for a single row

Miscellaneous Options

PHI Level ❓ | Not PHI ⬍ |

☑ Make this field available as a measure ❓
☐ Make this field available as a dimension ❓
☐ Make this field a recommended variable ❓
☐ Track reason for missing data values ❓

Cancel   Get Help With Domain Settings   Apply

Remove Field   Advanced Settings   ✕

Lookup Definition Options
From Folder

| Current Folder ⬍ | | lists ⬍ | | Test (Integer) ⬍ |

Name and Linking Options
Description

Add a description

Label

Import Aliases ❓

URL ❓

5

LabKey Server Premium Improvements

- Antivirus scanning
- File watcher improvements: script-based pipelines, moving files, append
- Amazon S3: performance, existing S3 buckets, additional pipelines
- Assay QC states
- LDAP user/group synchronization
- Multiple LDAP, CAS, and SAML configurations
- NLP pipeline/curation: compare results, Linguamatics i2e, conditional logic
- RStudio: Integrate with RStudio Pro, Shiny support, RStudio data browser
- R: Docker-based sandboxing & offloading, per-project R engines
- Analyze with Tableau Desktop, SSRS, MATLAB, Excel, Access via ODBC
- Sample Manager!

LabKey Server Future

- As always, platform evolves based on your feedback!
- Finish migrations: new field designer, SVN → Git
- Continued UX improvements: import, administration
- Precision medicine, genomics, clinical data investments
- Data provenance: row-level lineage, capture metadata about internal & external transformations, vocabulary metadata
- Query management & dependency tracking
- Versioning of module resources via Git
- Python: API improvements, visualizations, integrations
- Integrations: Spark/Databricks, Hadoop, S3 watchers?
- Platform improvements from product investments

LabKey's Other Offerings & Products

Compliant Hosting - managed deployments, HIPAA/FISMA/Part 11

FDA MyStudies - [2019-05-07 FDA Webinar](), FDA-funded support

Primate EHR - EHR Collaboration Meeting, platform contributions

Panorama Partners - Many improvements, premium features

LabKey Biologics - Bernard Lee, Product Manager

LabKey Sample Manager - Hannah Brakke, Product Manager

LabKey User Conference 2019

LabKey Biologics

October 3, 2019

What is it?

A suite of tools for biological entity registration (including sequences), workflow management, and integrated data exploration. It is designed to support large-molecule research and development.

	Sample		Target	Lineage	Assay Results	
	SampleID	**Date**	**Target Molecule**	**Expression System**	**Assay**	**Result**
	S12324	2015-11-13	M6	ES-1920	131802-06	28.93
	S12325	2015-11-13	M18	ES-2160	161832-21	20.30
	S16539	2015-11-20	M6	ES-1723	052320-16	27.74
	S17268	2015-11-20	M6	ES-1952	214623-10	11.17
	S27954	2016-06-13	M21	ES-2474	052320-16	5.54
	S27612	2016-06-20	M23	ES-3576	214623-10	6.03

What are some key features?

- Entity Registration
  - Capture unique sequence and molecule information
- Experiment orientation
  - Design experiments to interact with meaningful groupings of data
- Entity/Sample lineage
  - Define and query sample lineage
  - View in graphical or grid form

Why are these important?

- Entity Registration
  - Ensures unique molecule and sequence information linked to analytical data.
- Experiment
  - Not all data is equal. Work only with the data you care about.

- Entity/Sample lineage
  - Derivation history and experimental conditions direct process improvement and candidate selection.

Recent Feature Additions (2019)

Feature	Description
Assay Quality Control Workflow	Controlled access to assay data based on QC state
Reports Page	Landing page for all reports types, custom grid views, and charts
Flexible Codon Interpretation	Improved handling of degenerate bases
Lineage Graph Enhancements	1. Sample information sidebar 2. Single and double-click actions on samples 3. Links to other samples' lineage graphs, detail pages, or grid views

Upcoming Improvements

Area	Description
Usability	1. Enhanced user interface for importing, creating, and updating samples 2. New sample set and assay designer
Reporting	Tool to examine of data across assay designs with common samples: 1. Building and viewing reports within Biologics 2. Integrating reports with Experiment view
User Experience	1. Navigation and grid controls 2. Concurrent entity import 3. Supporting common sample actions 4. Export of all experiment associated assay data

What is LabKey Sample Manager?

LabKey Sample Manager is a feature-rich sample management application designed to bring greater efficiency to your sample processing while providing a unified view of your samples and related data.

- Built-to-purpose application
- Standalone product
- Easy use and ramp-up

Emphasis is to facilitate laboratory work and enable structured management of sample-related data.

Why focus on Sample Manager?

Current products are:

- Hard to use
- Expensive
- Difficult to deploy and administer
- Ugly

Sample Manager is:

- Focused on ease of use and adoption
- Designed to facilitate lab work
- Affordable
- Flexible while providing structured data capture

What are the key features?

Sample definition and capturing lineage

Connecting assay data to samples

Task-based workflow

Product walkthrough: scenario

My lab receives samples from different projects, follows relatively standardized procedures upon intake and performs 3 assays.

We can generate child samples from the samples we receive, and then perform work on those samples, and provide the data to internal and external collaborators.

Demo

Definition of new samples

New samples can be registered through:

- Manual entry of sample information
- Bulk insert with similar fields
- Upload through a tabular file

Sample Manager enforces unique sample definitions:

- Manual sample name definition
- Name expressions

Capturing sample lineage

Lineage can be assigned:

- Automatically during sample registration
- Later as a bulk update to a sample(s)

Lineage of samples can be:

- Viewed and interrogated in the new lineage graph and grid

Connecting assay data to samples

Link assay data by:
- Uploading a file
- Inserting manually

Attach assay data to samples:
- As part of a workflow job
- Independently
- Required sample ID field to link samples to assay data

Designing task-based workflows

Create workflow templates for reusability
- Set specific tasks to be performed in a workflow job

Workflow jobs instantiate an instance of workflow
- Assign tasks to users in the system
- Assign task and workflow job due-dates
- View the status of a workflow job

Each workflow job captures:
- The tasks performed
- The samples associated with that workflow
- The assay results associated with that workflow and set of samples

How can I get Sample Manager?

❖ Premium edition subscribers will get Sample Manager as part of their distribution upon launch

❖ New-to-LabKey and current community edition users can purchase Sample Manager as a stand-alone hosted product

What is different: product vs platform

Sample Manager is focused on…
- Creating a built-to purpose application
- Sharing data within the team

LabKey Server will continue to focus on…
- Allowing for many applications of the platform
- Partitioning and sharing data as needed
- Supporting enterprise level research

What is different: modules and features

Sample Manager has…

- Sample Types
- Assays
- Workflow

LabKey Server will continue to have…

- Advanced assays and transformation scripts
- Collaboration, study management, etc.
- Extensibility

What is available now?

Product Showcase on Day 2 (Friday)
- 9:00-9:45am (Westlake)
- 2:00-2:45pm (Westlake)

Hands-on with Sample Manager (Friday)
- Sign up at registration desk for a 15 minute time slot

Discuss features with your Account Manager

Sample Manager launch

Early 2020

Features available:

- Defining samples and capturing lineage
- Adding tabular assay data as sample outputs
- Creating workflows and workflow jobs

Upcoming Sample Manager features

- Create complete within-app experience
- Collaboration tools
- Freezer management
- Further integration with LabKey Server

... We want to hear from you!

Thank You!

LabKey®
PARTNERS IN SCIENCE