

Upgrade your Lab: Sample Management Beyond Spreadsheets

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Why do we use spreadsheets?



- Cost
- Convenience
- Accessibility
- Efficiency

Core Tenets of Sample Management



D+



Identification: Unique accessioning and clear sample labelling

F



Traceability: Chain of custody, adding sample context (metadata)

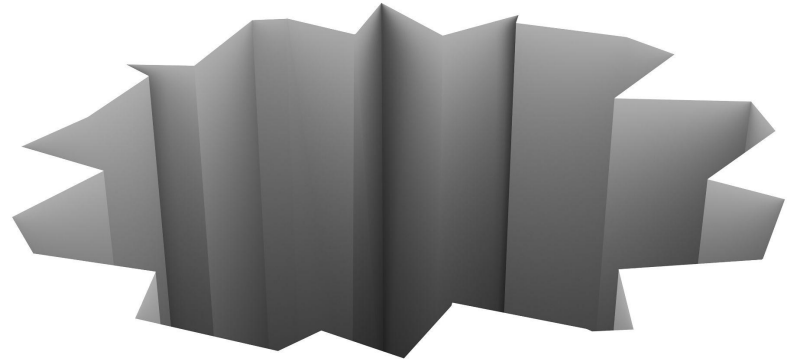
B-



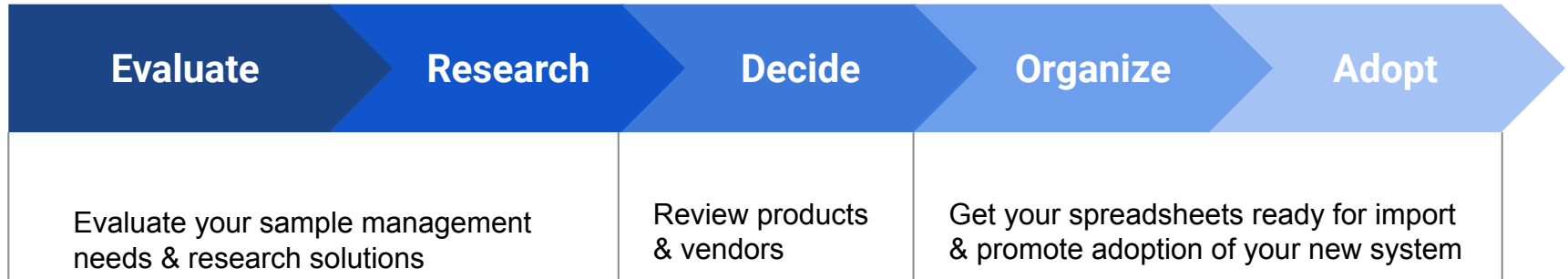
Findability: Locating a sample physically or searching for sample attributes



- **Data Integrity**
 - Human errors: Typos, sorting, copy/paste errors
 - Lack of data validation/standardization
- **Auditability**
 - No traceability via audit trail -- who did what
 - Poor help in troubleshooting
- **Scalability**
 - Massive spreadsheets
 - Dozens of files



Starting the Journey



Evaluate: Take Stock



- Include lab members
- Consider growth or expansion
- Compile what spreadsheets you have
- Understand how spreadsheets are used



Evaluate: How are spreadsheets used?



Sample/Inventory Management

Sample accessioning, Tracking, Freezer Management, Metadata capture

Lab Process Management

Sample Processing, Requests, Shipping

Experimental Data

Raw Instrument Files, Analysis, Experiment Design & Capture

Reporting

Capacity or project planning, regulatory agencies, collaborators, funding, etc.



Evaluate: Create a plan



1. Identify pain points

- Assess issues and/or risks of each of the spreadsheets

2. Prioritize

- Highest risk, most time-consuming, easiest to tackle

3. Determine goals

- Project-specific, function-specific, lab-wide tracking

Research Solutions: How can software help?



Freezer Management

Helps you keep your freezer organized | Supports Sample Findability

Sample/Inventory Management

Helps with overall sample lifecycle management | Supports Sample Identification/Traceability

Electronic Lab Notebooks (ELNs)

Helps capture experiments performed on samples | Supports Sample Traceability

Laboratory Information Management System (LIMS)

Holistic solution | Supports Sample Identification/Traceability/Findability



Issues with...

Look for...

Sample Identification

automatic sample accessioning (consider human-friendly sample IDs), label printing, bulk registration options

Sample Tracking

chain of custody, robust audit logs, flexible & customizable metadata, sample lineage graphs, sample processing or shipping workflows

Sample Findability

freezer management, search tools, querying/reporting capabilities

Tips for Evaluating Solutions



Test Real-World Scenarios:

Use real data and processes to test if the software aligns with your lab.

Evaluate User Friendliness:

The solution should be intuitive and easy to navigate to help with adoption & daily efficiency.



Check Flexibility and Scalability:

Determine how easily the solution can be adjusted to fit your current & future requirements.

Review Data Management and Security:

Compare how the software manages security, data storage, backup, and recovery and how that aligns with your organization.

Request Feedback from Users:

Gather feedback from your team on their experience with the software.

Beyond the software: Vendor considerations

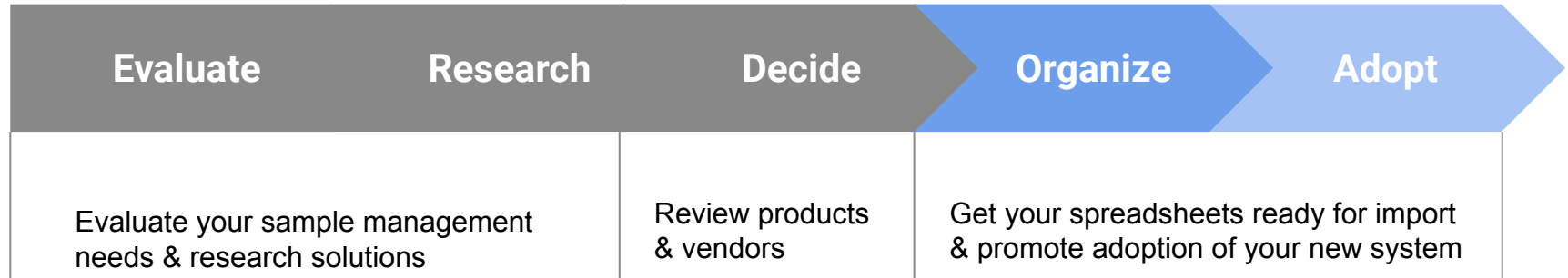


Keep in mind...

The sales process is an early indicator of how a vendor treats their clients and the support they will provide.

- What is the vendor's experience?
- What does training and support look like?
- How well is the software documented?
- What is the pricing structure?
- Are examples of client success clear?

Success after the Decision



Organize: Getting your data ready for a new system



Understand:

- Accepted formats
- Vendor resources
- Timeline(s)

Decide:

- Migration (rolling or complete) or cut-over?
- Keep, change or toss?

Act:

- Consolidate
- Clean



Adopt: Avoid Spreadsheet Backslide



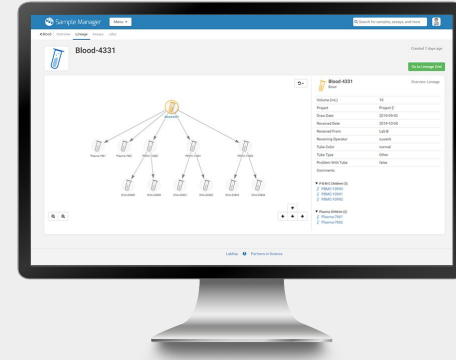
- Perform lab training with new system
- Find ways to provide value
- Adhere to new processes
- Be receptive to feedback
- Utilize resources your vendor provides (onboarding, training)



How LabKey can help



- Experience
- Built-to-purpose tools for sample & laboratory data management
- Unparalleled Support
- Migration, implementation & onboarding included



Sample Manager

- Freezer Management
- Sample & Lineage Tracking
- Assay Data Management
- Electronic Lab Notebook
- Workflow Management
- Querying & Reporting
- Full Audit Trail

Questions?



Organize: Data Cleaning Tips



- Avoid special formatting: format your spreadsheets in single-tab, tabular formats

Tube Type	Project	Draw Date	Tube Color	Received Date	Receiving Operator	Comments	Problem With Tube	Exhausted	sampleDate
						We should take care of this sample			
EDTA	Project H	3/14/19	normal	3/18/19	steveh		false	true	3/14/19
Heparin	Project H	6/27/19	normal	7/1/19	steveh		false		6/27/19
Other	Project H	11/28/19	normal	12/3/19	steveh		false		11/28/19
Heparin	Project H	11/17/19	normal	11/18/19	steveh		false		11/17/19
Other	Project H	9/20/19	normal	9/23/19	steveh		false		9/20/19
EDTA	Project H	5/6/19	abnormal	5/13/19	steveh		false		5/6/19
EDTA	Project H	2/3/19	normal	2/5/19	steveh		false		2/3/19
EDTA	Project H	4/23/19	normal	4/28/19	steveh		false		4/23/19
Heparin	Project H	5/28/19	normal	6/2/19	steveh		false		5/28/19

- Simplify where possible (eg. combine fields, remove coloring, etc.)
- Remove non-alphanumeric characters (eg. percent vs %)
- Make note of data entry discrepancies, eg. heparin, Heparin, green top tube, HEP
- Use current tools for data cleaning (eg. Excel's data tab)

