Research & Development Committee
Meeting Minutes

Date: Tuesday, April 11, 2017
Time: 1:00 PM - 2:30 PM
Location: University Hall, Room 420B (Collaboration Space)

Present: CJ Kim, Matt Hartmann, Chris Noel, Tiffany Grant, Larry Schartman, Phil Taylor, Annette Marksberry, Brett Kottmann, Chris Collins, John Kennedy, Adam Chekour, Jane Combs, Michal Kouril, Ted Baldwin, Brett Harnett, Kurt Roberts, Chris Noel

Apologies: Steven Doehler, Xia Wang, Richard Beck, Bruce Burton, CJ Kim, Michael Richardson, Leslie Schick, Jane Strasser, John Wallrodt, Elaine Miller, Abdulaziz Bahha

1. Review and Approve March Meeting Minutes (attached)
   - Chris Collins motioned to accept March minutes with no changes; Phil Taylor seconded the motion. The motion passed unanimously.

2. LabArchives Proposal (see attachments - Tiffany Grant)
   - Secure cloud-based platform for researchers to collaborate.
   - Current pilot funding ends on December 1, 2017, asking for funding for three additional years for enterprise license.
   - Without enterprise license, cost is $124 per seat, per notebook, per year. Notebooks can be shared.
   - Notebook data is tied to UC email address but notebook can be reassigned.
   - Need to know the upgrade path.
   - June 1 will be integrated with Office 365
   - Need to reach out to CECH and Engineering to see if they are interested.
   - See attached PowerPoint presentation.

3. FISMA Task Force Update (Brett Harnett)
   - Trying to finalize their recommendation and have a draft proposal
   - Task force has 11 members (see attached)

4. Research Week Agenda (Brett Harnett)
   - See attached schedule
   - April 17 – 21
5. Research Data Management Needs Survey (Jane Combs)
   • Ted and Annette will meet to discuss having a representative from this committee meet with the Office of Provost to present at new faculty orientation.

6. Other Updates
   • UCIT Senior Leadership Changes (Annette Marksberry)
     o Chris Edward, AVP for eLearning is leaving UC. Paul Foster will be interim in Chris’ eLearning role. Annette is assuming Chris’ role for the EIT program.

Save The Date Events:

THATCamp U Cincinnati 2017: Monday May 1 & Tuesday May 2 (possible half-day on Gaming with Dr. Evan Torner, May 3)
January 5, 2017

Dr. Tiffany Grant
Research Informationist
University of Cincinnati
College of Medicine
Health Sciences Library
231 Albert Sabin Way
Cincinnati, OH 45267

Dear Dr. Grant:

In response to your request for information about the NET+ LabArchives for use in your procurement documentation, I would like to elaborate some of the background information about Internet2 and its partnership with LabArchives as well as highlight some of the unique features of the NET+ LabArchives offering. The NET+ LabArchives solution has been crafted specifically for higher education, through direct partnership between Internet2, member schools, and LabArchives providing this unique offering to participating institutions.

Internet2 is a higher education consortium that was founded in 1996 by visionary leaders in higher education who understood that research would require collaboration across institutions and across countries. In the early years it addressed the development and management of infrastructural challenges focused on high performance computer networking. This private network delivers custom services at speeds at not generally available over commodity networks. Its original role focused on operating the world’s largest dedicated research and education network to 35 founding institutions. Since that time, Internet2 has expanded beyond networking technology to support over 220 institutions through its development of the core technologies used in multi---institutional...
identity management and through offering customized services developed and operated by community members. These services include trust relationships between institutions and individuals and groups, with open source projects and services such as Shibboleth, CAS and Grouper.

Internet2’s NET+ initiative aims to bring the higher education community together to partner with providers to customize solutions for our members and participating institutions that leverage the scale of higher education to yield even greater benefits than providing network connectivity alone. Through the NET+ initiative Internet2 has enabled technology providers to respond directly to the unique needs of university customers as well as to develop unique service offerings tailored to higher education. There are now 34 custom solutions in development or currently available to participating institutions.

The NET+ LabArchives service resulted from collaboration between a number Internet2 member institutions and LabArchives, a commercial provider of data management services via their cloud-based Electronic Notebook platform for both research and research education, selected by the members to meet the unique needs of our community. The standard commercial LabArchives enterprise offering by itself already constitutes a unique product, as compared with other service providers in this space, which are aimed at consumers and do not provide the same kind of enterprise scale collaborative features. The NET+ LabArchives service adds additional unique features for higher education. Specifically, the NET+ LabArchives service offers the following features that no other vendor currently provides:

➢ Federated Identity Management: The NET+ LabArchives service provides federated identity management using InCommon. Existing university infrastructure for identity management is integrated with LabArchives storage. No other cloud storage vendor currently provides integration with InCommon for federated identity management.

➢ Utilizes the Internet2 Network: The NET+ LabArchives service utilizes Internet2’s network capacity to connect users on campus with LabArchives’ servers. No other cloud collaboration and storage vendor currently utilizes the Internet2 network infrastructure to provide high-speed access to collaborative cloud file storage for
university users.

➢ **FERPA Compliance:** The NET+ LabArchives service includes contractual language related to data privacy and requires FERPA compliance. LabArchives has agreed to comply with all obligations that FERPA imposes on a School Official as that term is used in FERPA and has agreed to other limitations on its use of Enterprise Customer Data.

➢ **HIPAA:** LabArchives is fully HIPPA compliant and has a Business Associates agreement developed by university HIPPA counsel for all Internet2 NET+ clients as of February 2014.

➢ **Integrated Widget Platform:** Widgets Platform inside LabArchives provides a platform for users to create interactive HTML forms and applications that can be tailored to specific experiments or workflow.

➢ **Integration with Box for storage of Large:** NET+ LabArchives and Box joint enterprise customers can enable the storing of files over 250MB to be automatically stored in their institutional Box accounts, providing an extra layer of cloud-based secure storage, search and content sharing accessible through the NET+ LabArchives platform.

➢ **Accessibility Standards:** NET+ LabArchives services Professional and Classroom editions are compliant with the following Web accessibility standards and regulations:
  - Section 508 of the US Rehabilitation Act
  - The Americans with Disabilities Act (ADA)
  - Level A and Level AA of the WAI Web Content Accessibility Guidelines 2.0 (WCAG 2.0)

With the accessibility compliance of the ELN application, the Internet2 community can now meet accessibility standards and requirements for disabled scientists and science students.
The NET+ LabArchives service is the result of ongoing collaboration between the sponsoring universities, Internet2 and the LabArchives corporation to provide a unique offering to the higher education community. Specific characteristics that no other cloud vendor currently provides including the unique characteristics of the commercial service and those dimensions that have been enhanced and expanded upon as a result of its partnership with Internet2 in developing the NET+ LabArchives service.

Please be in touch if we can provide any more information to you about the NET+ LabArchives service.

Sincerely,

Shelton Waggener
Senior Vice President
Internet2 NET+ Services
LabArchives Electronic Lab Notebook

Proposal Summary

The Health Sciences Library (HSL) of the University of Cincinnati Libraries (UCL) is requesting $186,825 to fund the purchase of an enterprise wide LabArchives (LA) Electronic Lab Notebook (ELN) license for the University of Cincinnati. This license will provide UC with 3 years of unlimited ELN accounts for faculty, students and staff. This will include unlimited data storage, customizable user training, and single sign-on access. The amount requested will cover the cost of the enterprise wide license, the additional seats, advertising, library assisted training on LabArchives and assessment. This license will extend the year-long Academic Health Center LA license agreement that was provided to the HSL by the Provosts office in the form of Universal Provider funding.

Located in the atrium of the CARE/Crawley Building in the Medical Sciences Building, the Health Sciences Library (HSL) serves the research needs of the students, faculty and staff of the College of Medicine, the College of Nursing, the College of Allied Health Sciences, and the James L. Winkle College of Pharmacy, collectively referred to as the AHC of the University of Cincinnati (UC). As a member library of the UCL, the HSL joins UCL in its mission to empower discovery, stimulate learning and inspire the creation of knowledge by connecting students, faculty, researchers and scholars to dynamic, data, information and resources. While servicing the needs of researchers in the AHC, the HSL is constantly seeking new and innovative ways to provide tools and resources that will facilitate a greater level of research efficiency among AHC researchers. Researchers in the AHC are regularly generating large datasets through the usage of high throughput technology and genome wide analyses. Additionally, these same researchers must meet a number of Federal mandates regarding data management and sharing. An Electronic Lab Notebook (ELN) is an ideal way for the HSL to facilitate an increased level of research efficiency and data management among researchers.

LabArchives (LA) has been selected as the ELN vendor of choice due to its ability to assist in maintaining compliance, and to capture, secure and control data. LA also provides discipline agnostic tools and plugins to increase functionality, research efficiency, and management of laboratory data (Figure 1). The LA ELN is compliant with a number of Federal mandates, including: Family Education Rights and Privacy Act (FERPA), Internet2 Guidelines, FDA-21 CFR Part 11 and the Health Insurance Portability and Accountability Act (HIPPA). LabArchives can also be integrated seamlessly with Shibboleth to provide a proprietary login option, and can be integrated with GraphPad Prism, MS-Office, PubMed, BOX, Learning Management Systems, and a number of other software tools that are used extensively by researchers of the AHC and University wide. Additionally, the LA ELN can be co-branded with UC branding to provide a dynamic University sponsored resource to researchers.

According to data from the National Science Foundation and LabArchives, LabArchives is currently in use in 23 of the 25 top research institutions, and a number these institutions are utilizing the ELN on an enterprise wide basis. As a top RO1 Institution, it seems fitting that the University of Cincinnati join the ranks of these institutions in providing such a dynamic tool to its users. One of the Pillars of the UC Libraries Strategic Plan includes digital technologies, with an objective to advance discovery and innovation in medical care and knowledge through the collaborative development of resources, tools and services. With its ELN, LabArchives has a platform in place that will provide UC faculty
researchers with tremendous data management capabilities and research efficiency. Thus, the acquisition of an enterprise-wide license for the LabArchives ELN will help not only UCL and the HSL further its mission, but will also potentially help the University of Cincinnati achieve a greater level of research productivity.

**Rationale**

As researchers begin to acquire more data, and with the advent of newer technologies that generate electronic data more rapidly than before, researchers need methods to both manage and preserve their data. The current and most common mode of collection and preservation of laboratory data is the paper lab notebook which has a number of drawbacks when it comes to data management and preservation. These drawbacks include, but are not limited to, decreased research efficiency caused by poor record keeping and the inability to find data or interpret handwriting styles. Also, paper lab notebooks lack the ability to attach or store relevant and necessary data files that are pertinent to the experimental process.

All of these drawbacks, in addition to numerous others, are addressed by using an ELN. ELNs have been termed the “lab notebooks of the future” for their ability to meet needs that are not possible with a paper lab notebook. Electronic notebooks are being used extensively in the pharmaceutical industry, and their usage is gaining momentum in academia. Academic adopters of ELNs have reported that they are able to track their experiments in more detail, and follow and focus projects more efficiently. Additionally,
some researchers have reported that ELNs assist in probing correlations in research data that are too time-consuming to pursue using paper-based records.

**Data Management, Sharing and Compliance**

Recently, the National Institutes of Health, the National Science Foundation and numerous other federal granting agencies have put forth mandates governing the management and sharing of scientific data. The data that is generated by researchers is becoming more electronic in nature, and almost everyone is publishing, sharing and searching information in electronic form, from biological and literature databases to blogs of their latest ideas. Johan Weigelt, chief scientist of the Karolinska Institute was quoted as saying that ELNs ‘let scientists share everything: the bioinformatics, expression data, sequence analysis and all of the molecular biology, protein purification, crystallization and structural determinations’. In addition, electronic notebooks readily allow researchers to share research protocols and experimental results. Thus, the potential rewards of ELNs are many, including: increased documentation quality, sharing of methods and data, easy delivery of project details, and an improved working environment for the scientists who are expected to deliver more with less. LabArchives has a number of features (Figure 2) that can contribute to the management and sharing of research data. A personal communication from a LabArchives representative has indicated that other institutions are increasingly looking at the LA as a means to address federal mandates.

**Data Management and Compliance Features of LabArchives**

- Provides complete audit control-tracks and stores all revisions by users, for every entry. No entry can be deleted.
• Supports multiple entry formats including: rich text data, tables, images, sketches as well as image annotation.
• Researchers can share selected content with others, with the option of using DOIs. Once created, the DOI will remain active.
• Notebook user access can be managed to allow access rights to certain notebook pages and/or entries.
• Preserves all versions of all data in perpetuity.
• A PDF version of the notebook or a section of the notebook can be created. In using a standard PDF, the LA ELN is able to comply with the FDA’s requirement that electronic copies be readily available for inspection.
• The creation of a LA ELN offline notebook creates a local web site version of the entire Notebook (including all attachments) which, when loaded on a computer, can be run locally using any modern browser.
• Provides an automated version control at the entry and page level, utilizing the National Institute of Standards and Technology (NIST) time stamping.
• Data is stored securely in the cloud where servers are monitored 24/7.
• Multiple back-ups are performed daily and there are 4 redundant server locations in the United States.
• Data is encrypted at rest and in transit, and all back-ups reside in encrypted sites.
• The electronic signature of notebook pages is FDA Title 21 CFR part 11 compliant, and a customized widget can be created to support co-signing notebooks.

ELNs and Research Efficiency

Paper processes are often inefficient and prone to errors. Paper lab notebooks are neither searchable nor traceable, and they hinder collaboration and information sharing (3). The needs created by collaborative work are hampered by the lack of paper notebook functionality. Sharing information recorded in separate notebooks requires a scientist to copy the information and send it to the requesting scientist. This takes time and effort and distracts the researcher from his/her primary work (3). Much of the data obtained in laboratories worldwide is digital and can be easily integrated into an ELN. In general ELNs are searchable, archiving is simple, and copies are easily made for the institution and the individual researcher, many of whom will eventually leave the university.

The LA ELN is searchable, indexing not only the text and tags entered, but also the contents of most commonly used files, including PDFs, Excel, Word, PowerPoint and text. This is an essential feature of ELNs that saves researchers time and effort during the research process. The LA ELN allows researchers to view single experiments or the sum total of all experiments at a glance, expediting the ability to find correlations between various experimental procedures. It can be customized using built in widgets to extend its capabilities to match the researchers’ workflow. Also, the LA ELN comes "pre-loaded" with some database and Freezer Box Widgets that allow researchers to use them as is, or after modifying. With LabArchives, a database can be created, that can be shared with the lab or with groups of users to store important information about materials, including their physical location. This can help lab managers stay on top of inventory and know when to order new reagents and other necessary items to keep the pace of research going in their laboratory.

The LA ELN works on multiple platforms and devices including Mac, Windows, Android and iPad devices,
allowing researchers to store and access their data from virtually anywhere with internet access. In addition, Android and iOS apps, allow researchers the ability to add to their LA ELN on the spot, using portable devices, including smartphones and tablets. Researchers are able to add attachments, files, photos and data instantly, and can trust that their data will get backed up and protected immediately. Although the data entry 'pages' of an electronic lab notebook look like a typical web form, they are dynamic not static. Once an experiment is set up, data is automatically captured and stored in a structured database, often alongside instrument settings. And where a compound, protein or gene is mentioned, it can be hyperlinked to structure and sequence data on the web, thereby creating a single point of reference for relevant experimental information. Upon the completion of a grant, the researcher can very easily create a PDF to archive the information which satisfies University and federal regulations.

LabArchives Current Usage, Assessment, and Evaluation

To date 91 users have signed up to use the LabArchives ELN, and the majority of these users are from the UC College of Medicine. A key part of the current trial has been assessment and evaluation within the overall UC ELN implementation from beginning to end. Overall, those who have tried the LA ELN are pleased with the product and have found it easy to use. The number of users has increased on a monthly basis, as training sessions, marketing events and word of mouth increase (Figure 3). A survey was recently sent to all UC LA users to assess their opinions of the tool. Too few responses have been received to give an accurate assessment of the data. The results of the survey will be distributed when more respondents have answered.

A number of personal communications have revealed a great deal about user satisfaction and concerns about the LA ELN. Many users are satisfied with the tool, and some are making recommendations for others to try the LA ELN. One user commented “I see this tool as necessary to improve communication and collaboration among research teams and to create efficiency in our department.” Another current user commented “I think it is crucial to get more of us to archive our data, back up the data and to use electronic notebooks. We are doing our students a disfavor by not training them to be data responsible.” A number of researchers are hesitant to try the ELN, as they do not have the time to devote to learning how to use it, but preliminary survey results suggest that many current users found it easy to learn and use. Some researchers are unable to see the ELN as a complete substitute for their current paper lab notebook, as they do not have a portable device or tablet that can be used in the laboratory. While this is an issue, the amount of money saved on the ELN can be used purchase a viable small tablet or laptop for use at the lab bench.

In a personal communication, one researcher noted concerned over the stability of LabArchives, as well as the cloud storage aspect of the ELN. This researcher noted that if LabArchives were to go out of business, the data stored in the ELN would no longer be accessible. The lack of an in house storage of UC LabArchives data seemed problematic for the researcher as well. LabArchives contracts with Amazon Web Service, a world renowned cloud computing service to store and back up data multiple times daily in 4 redundant server locations in the United States. Additionally, LabArchives offers enterprise users the optional service of providing the institution a portable backup service of the notebooks once a year, and users are able to create offline versions of their notebook at any time of their choosing. This offline version of the notebook would allow researchers access to their raw data as
well as remain in compliance with granting agencies.

Figure 3. Screen shot of LA usage at University of Cincinnati

Budget in Depth

We are requesting $186,825 to cover the cost an Enterprise Wide Professional Edition LA ELN license for the University of Cincinnati. This license will provide an unlimited access to the LA Professional Edition
ELN to faculty, students and staff of UC, user training and support and among a number of other features (Figure 5) for three years. The professional edition is specifically designed for use by principal investigators, lab managers, post-doctoral fellows, and graduate students, making it the ideal product for AHC users. As part of the enterprise-wide license, LabArchives developers will work with UC IT members to facilitate LA integration with Shibboleth for single sign on access using UC credentials. An Enterprise Wide License is the preferred choice for this pilot as it offers numerous benefits that cannot be obtained through individual accounts. Box and Shibboleth integration, which are important for information security, are not included with individual accounts. Enterprise accounts come with unlimited data storage, and extensive training and services offered by LabArchives, features that are not included with individual user accounts. Other features included in enterprise accounts can be seen in Figure 4, but in essence, individual LA ELN user accounts do not come with a number of useful features that help make the ELN an extensible platform for research.

![LabArchives Logo](labarchives.png)

Figure 4. LabArchives Pricing Snapshot
Summary

The authors of a recent publication stated ‘we believe that the question is not whether ELNs will become standard or even required in the academic life sciences, but when’ 5. ELNs have rightfully been named the lab notebook of the future, and as their implementation becomes more commonplace, exploration of this research tool for a University of Cincinnati enterprise-wide implementation is a wonderful opportunity to experience how ELNs are able to support greater research efficiency and compliance with University and Federal regulations.

The pilot project was supported by Melanie Cushion, Senior Associate Dean for Research of the College of Medicine, who has said the LA ELN would provide “an invaluable support to researchers of the College of Medicine and the Allied Health Center”. Also, personal communication with a Cincinnati Children’s Hospital Medical Center (CCHMC) employee has indicated that LabArchives is the ELN of choice for an enterprise wide license after having reviewed proposals from a dozen of the top ELN vendors on the market. Thus, the selection of the LA ELN by a close research partner of the UC AHC is highly suggestive of the excellence of the LA ELN product. If adopted, the University of Cincinnati would join Massachusetts Institute of Technology, Yale University, Purdue University, Stanford University, and Emory.
University, Cornell University, the University of Madison-Wisconsin, and a host of other colleges and universities who are utilizing the LA ELN.

Quotes from LabArchives Users6

LabArchives has been transformative for researchers, delivering multiple benefits. Researchers have found that LabArchives integrates seamlessly into their research practices, rather than changing the way they do research. It is saving staff and students time and making their research more efficient. For some that means increasing the amount of experimentation they do each day, and with others it has enabled more expansive analysis of research findings and writing. ~ Dr. Andrew Black, Director, Research Development and Collaboration, University of Sydney

LabArchives has been a great tool for improving efficiency in my laboratory. We use it to organize lab notebook entries, protocols, and scientific literature. I can asynchronously work with my colleagues to assess research progress, troubleshoot where needed, and share documents and data. ~ Dr. Jayagopal, Ph.D., Assistant Professor of Ophthalmology / Visual Sciences, Vanderbilt University

In our hands LabArchives becomes more useful the longer we use it, as we build our libraries of protocols and SOPs, our databases of plasmids, glycerol stocks and inventories of chemicals, safety protocols and MSDS sheets. ~ Richard van Rijn PhD, Dep. Medicinal Chemistry and Molecular Pharmacology, Purdue University

The biggest benefit for me in the lab is that I can stay on top of projects remotely and asynchronously and catch mistakes without specifically being asked for input. Also, I think overall the users in the lab save a lot of time when it comes to meetings because all their data is already in electronic format. ~ Dr. Carol Wilusz, Associate Professor, Colorado State University

We chose LabArchives to meet the growing number of requests that we had received for a lab notebook software. It met all of our requirements, including security and usability requirements, at a reasonable price. ~ Barbara Friedman, Director, Academic Technologies, Cornell University

References


