Laboratree - A Web-based Platform for Team Research Collaboration

ABSTRACT

Team science projects are collaborative, cross-disciplinary research projects organized to solve complex scientific and technical problems. Collaborators within these projects work as virtual teams both inside and between institutions. The Allen Curve shows that interaction between collaborators decreases when they are separated by more than 30 feet. Decreased interaction results in less frequent communication, informal exchange of ideas, document sharing, and data sharing. Cummings and Kiesler concluded collaboration at a distance results in poorer project outcomes.

We are developing Laboratree as a new web-based research collaboration platform to overcome the challenges of distance collaboration. Laboratree is not a Facebook for scientists or social networking site. It is a secure virtual research environment for project communication, document and data sharing, and real-time informal exchanges of ideas. Laboratree accomplishes document and data sharing with a drag-and-drop folder-based document tree. This feature includes permission-based document sharing, checkout for review and editing, full version control and tracking, and a user configurable metadata system.

Laboratree supports open source and open data standards. We will be implementing application exchange through OpenSocial and incorporating user authentication using OpenID and InCommon. We also plan to add functionality for implementation of ontologies to help Laboratree users discover new information about collaborators and make new connections.

VIVO is a natural complement to Laboratree. We plan to use VIVO identities and ontologies to help Laboratree users discover new information about collaborators and make new connections.

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Team Science Challenges

- Standardized terminology
- Team discussions
- Collaborative document creation
- Secure virtual research environment
- Document and data management and sharing

Team Communication

- Facilitates ongoing team connections
- Project team or member-to-member messages
- Moderation by project manager(s)
- Messages sent within Laboratree and by e-mail

Notes

- Record experimental results
- Comment on experiments and data
- Formulate hypotheses
- Create interactive and updatable documents

Team Discussions

- Hold online meetings
- Reduce time zone challenges
- Discuss experiments
- Brainstorm project ideas
- Plan next steps
- Maintain a record of discussions for reference

Real Time Communication

- Communicate with team members who are online
- Maintain awareness of team member's activities
- Exchange important information quickly
- Can archive dialog for reference

Secure Virtual Research Environment

- Collaboration (group) and project workspaces
- Customizable user control center
- Aggregation of Activity and Data Connects to other functions

Document and Data Management

- Drop-and-drag folder-based document tree
- Permission-based document sharing
- Document checkout for review and editing
- Full version control and version tracking
- Document and data file identification with user configurable metadata system

Application Sharing

- Supports open source and open standards
- Can host applications
- All team members can use the same application

Current Status

- Product demo completed
- Beta product near completion
- Beta test with collaborating science teams to begin in fourth quarter of 2010
- Seeking beta test sites

Future Direction

- Application exchange through OpenSocial
- Integration with VIVO
- Implement ontologies
- Open ID/IN Common user authentication
- Platform extensibility
- Project management
- Workflow management