

## 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 to identify files. Laboratree's project discussion board permits online discussion of experimental results. Its journal (wiki) allows project participants to create interactive and updatable documents. Collaborators can communicate by sending messages to the project team or individual members or hold impromptu chats in real time as the need arises.

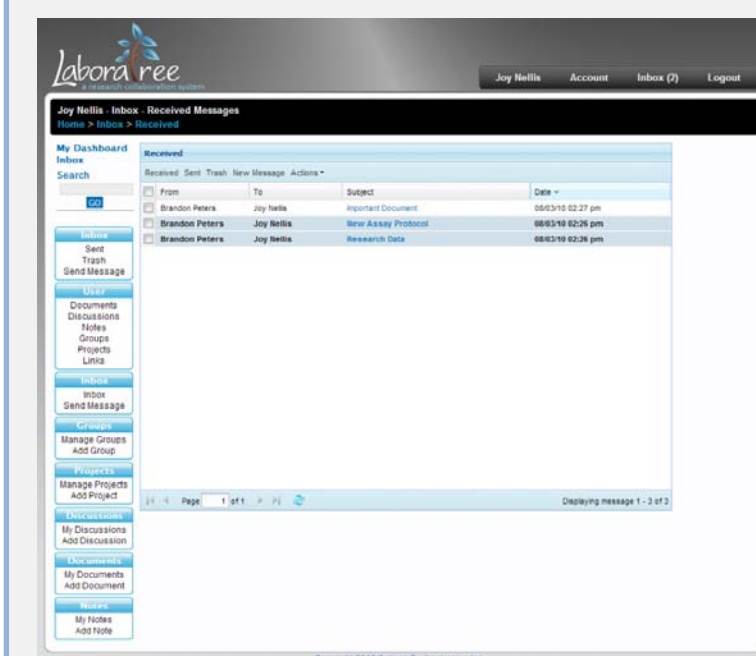
Laboratree supports open source and open data standards. We will be implementing application exchange through OpenSocial and incorporating user authentication using OpenID and InCommon. We also plan to add functionality for project and workflow management.

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
- Real time communication
- Application sharing



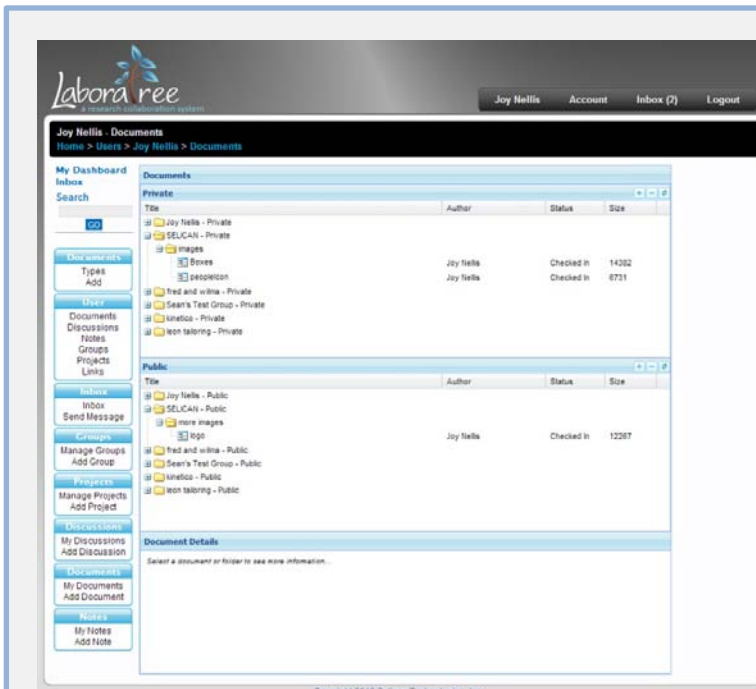
### Team Communication Messaging

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



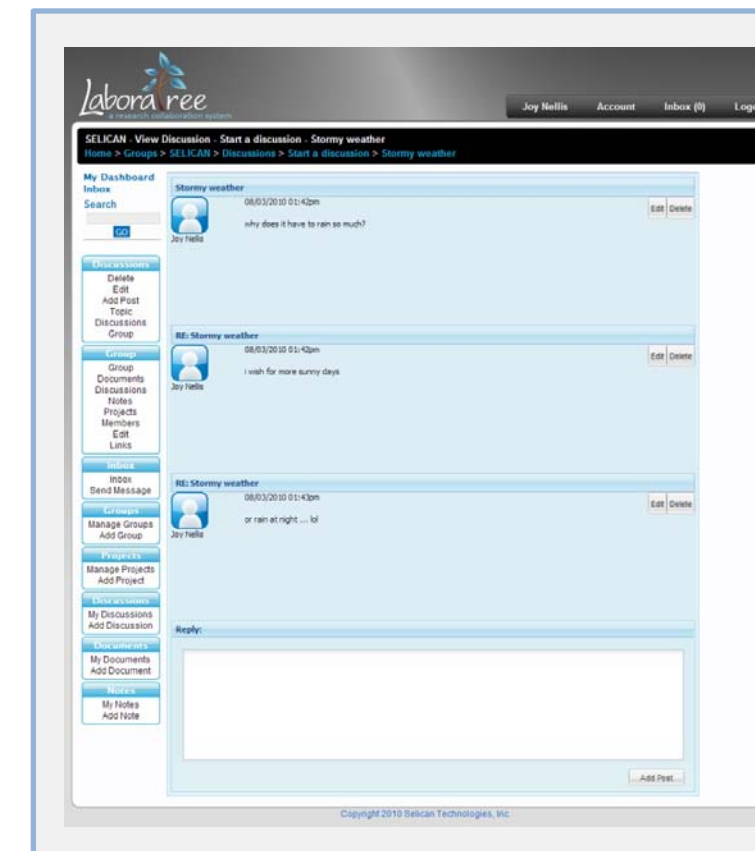
### Notes

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



### Document and Data Management

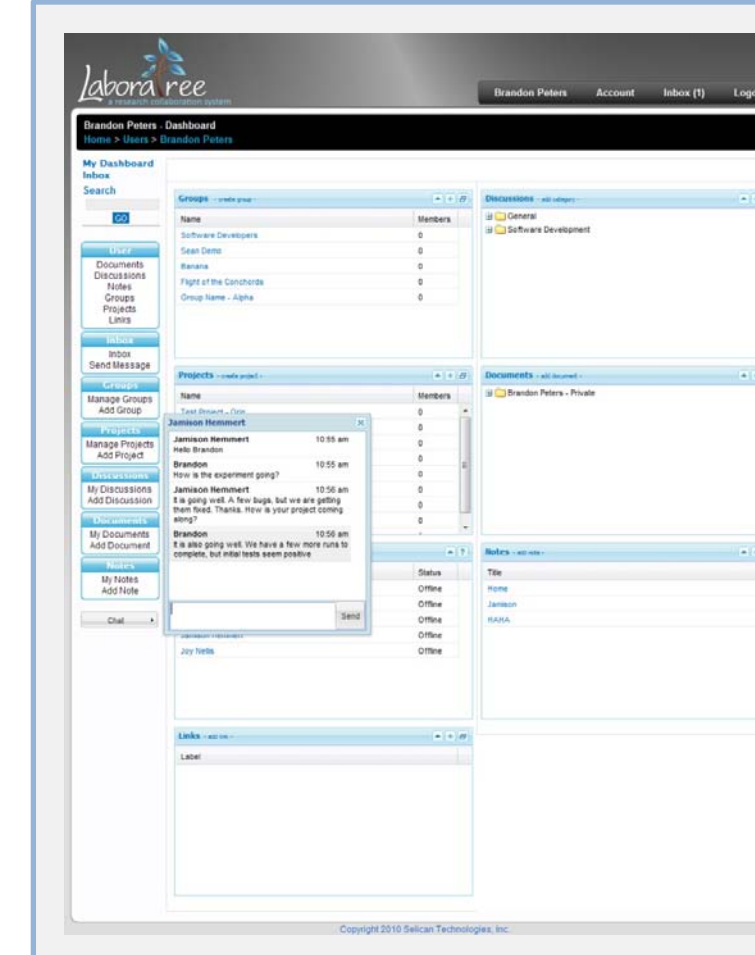
- Drop-and-drag folder-based document tree
- Permission-based document sharing
- Document checkout for review and editing
- Full version control and version tracking
- Document and data file identification with user configurable metadata system.



### Team Discussions

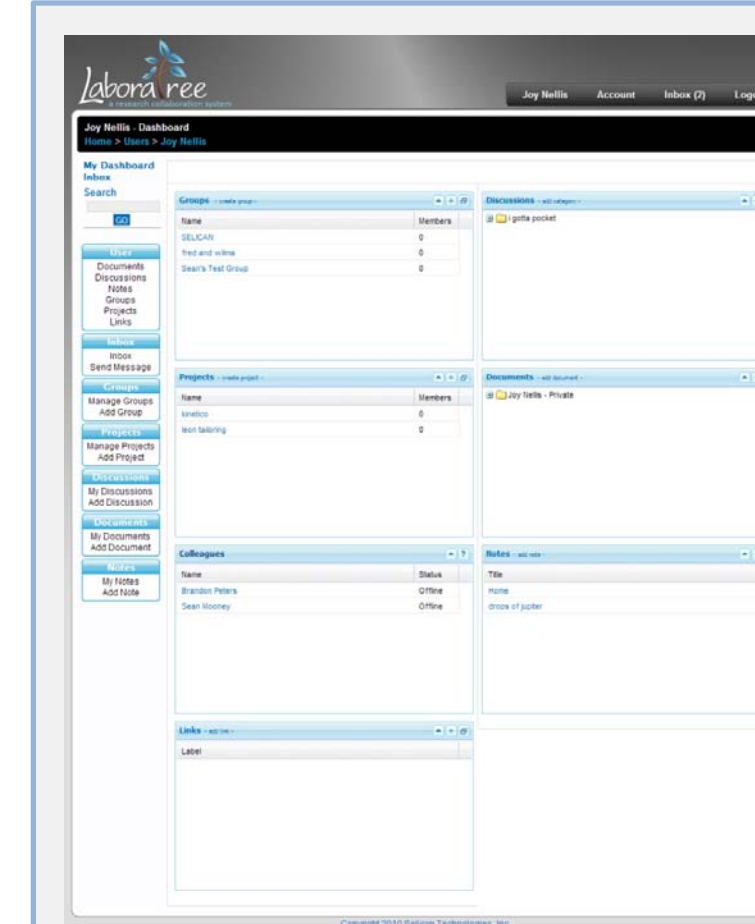
#### Project Discussion Board

- 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

## 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