

To: Library Lab Committee
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Subject: Report on H2O—Adaptable Digital Textbooks

Project summary

H2O < <http://h2odev.law.harvard.edu> > aims to transform the textbook market by allowing professors from diverse disciplines to create, modify, and adapt their own content, and submit it for use, refinement, and development by other teachers, scholars, and students. There are numerous steps needed to realize that goal, and several crucial ones draw uniquely from library resources and talent. The H2O team comprises HLS/SEAS/HKS Prof. Jonathan Zittrain; a Project Manager based at the Harvard Law School Library and the Berkman Center for Internet & Society; technologists and fellows at BCIS; administrators and reference librarians of the HLSL; external developers; temps; and student interns. We are on track to continue to expand H2O this year both by adding features to the underlying platform and by incorporating new materials and textbooks, with H2O already in use in several Harvard classrooms.

Accomplishments

With generous support from the Library Lab, H2O has made significant progress since April. In particular, following extensive development and bug testing, we soft launched the site in November 2012; as a result, users around the world can now freely create and remix their own textbooks under a Creative Commons license. The soft launch occurred following the feature set being expanded significantly: the user interface was enhanced to streamline content creation, and the site now allows the use of non-text forms (PDFs, images, audio, and video). The H2O team has also instituted bug fixes and additional features. Alongside technical developments, content creation continues apace, with two HLS professors using H2O this fall and three more scheduled to use it in spring 2013, pointing towards availability of an entire first year law school curriculum on the platform. The following provides a summary of key technical and substantive accomplishments during the project period.

Technological Developments

The funds provided by the Library Lab have supported the development of new features and enhancements to the existing H2O platform's functionality. The new Project Manager coordinated these developments, in cooperation with developers at BCIS and End Point, interns and temps who performed extensive bug testing, faculty, and HLSL partners. The two highest initial priorities for development were updates to the H2O user interface, aimed at increasing ease-of-use and accessibility, and mechanisms to support non-text file formats, including PDFs and images. The technical developments outlined below were brought about through extensive bug testing by a team of full-time student interns, the Project Manager, temps, and a BCIS fellow. The workflow of these developments is documented at < <https://cyber.law.harvard.edu/projectmanagement/projects/h2o> >.

User Interface

H2O's interface now allows users to upload cases and text blocks much more efficiently and accurately. As a result, a large number of cases and text blocks have been added to the platform, edited in the

platform, and added to new textbooks (dubbed “playlists” in H2O). User-interface developments since July 2012 include the following:

- Implementing a WYSIWYG editor for text uploading and editing;
- Creation of the prototype of a user dashboard;
- Ability to use anchors as hyperlinked footnotes in cases, text blocks, and collages;
- Advanced search functionality ranking entries based on relevance;
- Ability to edit text blocks once they have been submitted;
- Ability to edit URL destinations;
- Playlist items no longer occluded by tags;
- Pre-populated URLs;
- Ability to delete submitted cases;
- Adjusting the style sheet such that hiding an “unlayered” view does not push layered text out of the browser window;
- Recovering previously hidden tags in case inputting;
- Indenting block quotes in cases, text blocks, and collages, during both inputting in the WYSIWYG editor and at display;
- Allowing users to save while in the HTML screen during case-inputting;
- Maintaining a footnote’s link to the text when a new layer is added to the footnote;
- Allowing users to drag and drop playlist items into a new order;
- Automatically re-numbering re-ordered playlist items;
- Maintaining a Table of Contents after collaging;
- Ability to select text to layer or annotate in a collage;
- Ability to collage text blocks;
- Ability to add a collage to a playlist;
- Maintaining center-aligned text;
- Ability to add new jurisdictions for case administrators; and
- Ability to escape out of drop-downs and pop-ups with a click or the escape key.

Non-text Forms

Alongside developments to the user interface, the H2O platform now allows users to add non-text forms. In particular, users may now add, through embedded URLs, the following types of non-text forms to a playlist:

- Video;
- Audio;
- PDFs; and
- Images.

Additional Technical Developments

While pursuing those two top priorities, the H2O team also has been able to make progress on further expanding other assets in its feature set. Among the developments in this domain including the following:

- Development of a prototype of a permissioning system, whereby a professor can assign various levels of permission to her assistants, interns, and others helping craft her playlist;

- Development of the prototype of a karma system, whereby each user obtains karma points based on her contributions to the site;
- Initiation of development of a syllabus-splitting system, which would allow a professor to automatically revise her syllabus on a time factor such as a minutes, classes, or days; and
- Initiation of object relevance measurements and visualizations.

Content Development

In coordination with bug fixing and feature development, since July 2012 the H2O team has engaged in a period of extensive content development. The following list highlights some of these efforts:

- *Cybersecurity*: In collaboration with a team of interns and staff from BCIS, H2O helped to facilitate the creation and dissemination of Prof. Jack Goldsmith’s Cybersecurity playlist < <http://h2odev.law.harvard.edu/playlists/633> >;
- *Criminal Law*: Since July 2012, the H2O team developed — in cooperation with and at the direction of Professor Jeannie Suk — a new Criminal Law syllabus, slated to be used in spring 2013 < <http://h2odev.law.harvard.edu/playlists/671> >;
- *Corporate Law*: Per the request of Prof. Holger Spamann, the H2O team provided research and analysis concerning the most commonly cited cases across the leading Corporate Law casebooks, in order to lay the groundwork for the development of a new H2O-based playlist which Prof. Spamann plans to use in fall 2013;
- *Torts*: With support from HLSL open access and reference librarians, the H2O team identified public-domain versions of Prof. Zittrain’s Torts playlist for use in his spring 2013 HLS course; and
- *Intellectual Property*: At the behest of Prof. David Post, the H2O team created an Intellectual Property playlist for his IP course < <http://h2odev.law.harvard.edu/playlists/548> >

Challenges

During the project period, the H2O team undertook a set of coordinated tasks aimed at enhancing the platform’s functionality while also increasing the amount of high-quality academic content and cases available for use. Challenges faced by the project team resulted primarily from time constraints. As indicated above, the team prioritized increasing H2O’s ease-of-use and accessibility, and providing support to non-text file formats, especially PDFs, audio, video, and images. The team also prioritized extensive bug testing and content creation in collaboration with research librarians and professors. In light of these overlapping and mutually reinforcing priorities, development aimed at new features — such as a refined permissions system, a heatmap and a syllabus-splitting mechanism — continued but did not reach the deployment stage. Nor did the team have sufficient time to revise and implement the karma system (alongside new UI and design elements), syllabus genealogies, the Rotisserie, and the Question Tool.

Next steps

Building on the strong forward momentum of the project over the last four months, the H2O team is primed to continue to expand and develop the platform for use at Harvard and beyond.

On the technical side, in addition to continuing to make user interface and design enhancements, as well as modifications to the Rotisserie and Question Tool, we also hope to continue to develop a number of features requested by professors and students in the initial pilots. These include: syllabus genealogies,

which allow professors to see how far their work and syllabi have traveled; “case heat-mapping,” which uses Kindle-style highlighting to find common ground between text edits; and “class splitting” to allow professors to spread their assigned readings over a variety of weeks and class meetings. We further aim to enhance the prototype of a permissioning system (whereby a professor can assign various levels of permission to her assistants, interns, and others helping craft her playlist) and the prototype of a karma system (whereby each user obtains karma points based on her contributions to the site).

In terms of adoption, the H2O team plans to focus on promoting use of the platform across intellectual domains at Harvard and beyond. At Harvard, the team hopes to recruit faculty outside of the law school, while also supporting the creation of four to six additional textbooks so that by fall 2013 all of the standard first-year-law-school curriculum would be freely and publicly available on the platform. The team has already begun reaching out to Boston-area universities in order to showcase the platform to professors and librarians.

Code

All H2O code is freely and publicly available at Github: < <https://github.com/berkmancenter/h2o> >.

Publicity and Presentations

The H2O Project Manager and Technical Lead (Dustin Lewis) presented H2O to the Association of College and Research Libraries New England Chapter’s Collection Development Interest Group Fall Program at Northeastern University on November 1, 2012. In addition, Mr. Lewis presented H2O at a Brown Bag Lunch at the Harvard Law School Library on September 26, 2012. Finally, Mr. Lewis is slated to present H2O, along with Professor Zittrain, to the Law Libraries of New England Fall Meeting at Harvard Law School on December 7, 2012.