Writing on the Web (2.0)?

In most scientific disciplines, the majority of academic papers are written collaboratively. They also tend to undergo several rounds of revision, with new content often being added after peer review and style and format reworked for target journals. Currently, this tends to involve emailing versions of the document between authors, or storing versions on shared drives. However, a new breed of online applications that mimic the functions of desktop applications could change the process of producing a scientific paper.

Ajax and the writable web

The traditional problem with using web applications to perform functions similar to those carried out by personal computers is the time it takes for the client to communicate with the server. This means there is a delay in performing the command given by the user. Recently, Google Earth demonstrated that this barrier had been removed: moving the mouse on your personal computer results in instantaneous spin or zoom onscreen. Google Suggest is another example: with every keystroke the suggestions in the drop-down box are updated (1).

The secret to the instant responses of this new generation of web applications, sometimes referred to as WYSIWYG ('what you see is what you get'), is the use of Ajax. Ajax stands for Asynchronous JavaScript + XML and, in these applications, is used to form an extra layer between the server and the client, simultaneously creating the visible interface that the user sees and maintaining continual contact with the server. This allows the user's interaction with the application to occur asynchronously, giving the instant onscreen results (2). The extra layer, also referred to as Middleware, can also allow for security functions including the authentication and authorization of users.

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WYSIWIG applications

This technology can also be applied to functions traditionally performed on a single personal computer, such as writing, editing, and creating spreadsheets. One example, expected to attract more attention after its recent acquisition by Google, is Writerly. Writerly is a WYSIWIG word processing application that runs within a web browser. It mimics many of the functions of Microsoft Word and it is possible to load documents authored in Word and other word processing programs into Writerly and vice versa. Writerly also possesses several advantages over traditional word processing programs. The fact that documents are stored online (currently individual files must be under 500k but there is no limit on users' total storage space) makes it possible to access them from any computer with an Internet connection. The documents are protected by layered security architecture, and can only be viewed or modified by those the creator invites to do so via email. The revision function stores all previous versions of the document, so that it is clear which changes have been made by which authors and at what time. It is also possible to revert back to any earlier version at any stage.

Other examples of online word processing applications include AjaxWrite. This is a more basic program that works only with Firefox and lacks the advanced editing features of Writerly. Although it is compatible with Word, it also lacks several of its features (for example, while editing the draft version of this document in AjaxWrite, I wasn't able to add the hyperlink to the web address). Another is Zohowriter.com which had more advanced features but does not yet seem entirely compatible with word (it made a draft of this document crash and refuse to reopen) and appeared to lack security features, saving my document directly into a public folder.

Other applications have also been developed to mimic the Microsoft's desktop applications in an online setting. These include, iRows, an Excel-like web application and Thumbstacks, which performs similar functions to Powerpoint. Finally, an entire web-based office package is offered by gOffice. This service concentrates on formatting, outputting documents in PDF. It is less compatible with Word than the online word processor programs, asking that text should be pasted from text only or html files. Like most of the other free services, it offers unlimited storage space and additional perks such as free fax and postal services. Another way to enhance communication over the web is to integrate existing systems such as mobile phones, personal digital assistants (PDAs) and email and messenger services. One service that offers this is Remember the Milk, an online organizer program. Remember the Milk also allows collaboration with groups set up for various tasks and allows integration with Google

Calendar, Apple iCal and Mozilla Sunbird.

Online organisation

While desktop applications are usually delivered as a package, are largely interoperable, and produce documents that are stored in the file system of a local computer, online applications clearly have different requirements when it comes to integration and storage. Writerly also provides a novel solution to the problem of storage and retrieval of documents. Like other 'Web 2.0' applications, Writerly makes use of Technorati tags: keywords which a user can attach to their document and which will then retrieve all documents with that keyword.

Writerly is also designed to be integrated into Netvibes, an example of another element of the move from personal computers to online applications. Netvibes is an online 'desktop', which can be personalised by the user.

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So far, Netvibes, and competitors including Google Desktop and Pageflakes, essentially work as feed aggregators, in which the display of RSS feeds can be altered by the user. Netvibes also allows the user to integrate applications that use OPML (Outline Processor Markup Language) to develop more complex XML-based services. A new service from Microsoft, Microsoft Live performs a similar function, with the additional capacity to save searches from its academic search feature directly onto the desktop. An alternative way to integrate continuously updated searches into one of these services is to run a search in HubMed then integrate the RSS feed into any of the rival online desktops. As well as RSS feeds and OPML, Microsoft Live's desktop function also supports Gadgets, another breed of XML-based applications that perform simple calculations such as currency conversion or weather reporting based on continuously updated information. The Microsoft Live blog gives Windows users instructions on how to design their own Gadgets or select from those designed and tagged by previous users. Apple's Widgets provide a similar service for Mac users.

Critics and alternatives

There are some critics of the movement towards transferring software online. One of the most vocal is Liam Breck. As he points out in his blog, 'Web 2.5', there are some very real issues of security surrounding the storage of data online: the record of search engines for respecting the privacy of users is arguably patchy. More fundamentally, he contends that Ajax, like earlier experiments with ASP is concerned with 'pushing personal computing up to the web, rather than bringing the web down to personal computers' (3) Breck's personal vision is a web model that reverses the client-server relationship altogether utilising millions of personal 'mini servers'. A prototype of one of these servers is airWRX. The idea is that the program is downloaded to a USB flash device and works as mobile webspace, using XML and flash to communicate with authenticated client computers. The services offered are quite similar to those boasted by the new online office programs: instant WYSIWYG formatting, keyword searches and ease of collaboration. Unlike services like Writerly that mimic Microsoft Office layouts, however, the airWRX layout is described as analogous to a spiral-bound notepad for a single user – displaying a single page but easy to flip forward or backwards - and to a whiteboard for multiple users viewing the same screen. Breck also proposes alternatives to web-based service such as the 'Pocket Wiki', although as one comment pointed out, the problem with offline alteration that are uploaded in stages is the potential for more than one version of a document to exist, having been modified variously by different users.

While Breck's services resolve some of the security issues surrounding creating and storing data online, even skeptics are coming to accept the concept that offline services lack the immediacy and potential for collaboration, while personal computers lack the storage space, computing power, and organizational tools, of online services (4). The research that goes into the creation of a scientific paper is increasingly taking place online: databases are used to find drug candidates or test binding interactions, online bibliographic services to identify references and bookmarking services store them online. When a paper is produced, it is increasingly read and referenced online. It would seem logical that the next stage in this evolution is a move towards creating research articles online. However, the issues that remain surrounding security must be resolved before confidential data can be entrusted to online storage and the question of long-term storage of data, as well as continuity in web services must also be addressed: as a BBC commentator puts it, 'If Web 2.0 is the first stage in a revolution, we need to make sure it's a permanent revolution' (4).

References

(1) For an in-depth analysis see: Chris Justus, "". 04/12/0 Google Suggest Dissected 4 Server Side Guy.
(2) Jesse James Garrett. "Ajax: A New Approach to Web Applications"
(3) Liam Breck. "Web 2.5 is the personal web", Web 2.5 blog, 05/12/05.
(4) Bill Thompson. "Learning to Love Web 2.0", BBC technology website 27/03/06.