User Interfaces for the Global Public Library
by
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Several organizations are scanning and digitizing millions of books in the collections of the world's leading research libraries.[2] This paper suggests a new generation of software that will make it easy to store, retrieve, and use the online resources in this emerging global public library.

The basic step is to scan the spines of books as well as the contents. These images become icons that can be placed in bookcases on the screens of personal PCs. Clicking on the icon will open a book for reading, regardless of where it is stored (on the Internet or on the user's hard drive). Four levels of user-interface software (described below) can build on this foundation: For example: Level 2 software modules will allow a user to select from among the most beautiful libraries in the world for a personal collection (the library of a large English country house, Jefferson's library at Monticello, etc).[3]

I. Levels of Software

A. Level One: The Public Interface (free)

The basic software module will provide an office with bookcases along a wall, a file cabinet for storing reprints, and a desk. It will be an attractive three-dimensional space.[4] [An example of 3-D interface technology is Jacques Pepin's kitchen - http://www.kqed.org/w/jpfastfood - click on parts of the screen.] The basic startup module will allow any user to acquire and store book icons for rapid and direct access to about 300 – 400 volumes in the global

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[2] In addition to the Google and Amazon projects, a useful source of information is the Related Projects section of www.archive.org.

[3] Guillaume de Laubier, The Most Beautiful Libraries in the World (New York: Harry N. Abrams, 2003). Foreward by James H. Billington.

public library and to create book icons if these are not currently available.[5] [6] [7]

B. Level Two: The Personal Library

The second level of software is add-in modules that allow users to create their own large personal libraries with thousands of volumes. Options might include the library of a large English country house, with a fireplace and high tiers of dark-paneled bookshelves, Jefferson's library at Monticello, and the studies and desks of famous writers like Ernest Hemingway. Other options, in different styles, might be drawn from the interior designs and architectures of the world's notable private collections and public libraries.9

The empty shelves of these large libraries could be filled, one volume at a time, by the drag-and-drop method. However Level Two software also would include checklists of recommended basic holdings, by subject, so that basic volumes/icons could be selected quickly: (For example, there are already expert-selected recommendations of the best 40,000 volumes in 300+ fields.)[8] It

[5] Some of the material in the global public library may require payments of royalties or may not be provided free by the Google and Amazon projects – for example, current reference books or current popular fiction. An attractive option would be to allow users to register with their local public library systems and automatically access this material via their local public libraries who would serve as purchasing agents for access to this material. The economics and logistics of the global public library are beyond the scope of this paper. However it would be very attractive for the public library systems of the world to offer free access to all material in the global public library to everyone who holds a local library card. The software can make it possible to pay royalties (via public library system subscriptions) while preserving the principle that access to online information should be free to individuals.

[6] It would be attractive to allow online virtual tours of the stacks of the world's leading research libraries whose contents have been digitized, so that users can browse (and experience the serendipity of discovery) and select interesting volumes directly.

[7] The module would include options for handicapped users – e.g., to increase text size, or text-to-speech options.

[8] Geoffrey O'Brien, The Readers Catalog 2nd Edition: An Annotated Listing of the Best 40,000 Books in Print in Over 300 Categories (NY: RC Publications, 1997). See also, for ideas, Judie L. H. Strouf, Literature Lover's Book of Lists: Serious Trivia for the Bibliophile (San Francisco: Jossey-Bass, 1999).

would be easy for individual users or members of a family to assemble distinguished library collections in many areas: from Shakespeare, to cookbooks and gardening, to Agatha Christie mysteries, to the study of the Bible or Talmud or Koran, to the history of art, to children's stories.[12]

Level 2 software would include options for customization. For example, a user could designate new colors or bindings for books, add (or remove) Library of Congress or Dewey Decimal classification numbers, or invent new classification systems. There could be sections for music and film with options for CDs and DVDs.

C. Level 3: Specialized Rooms/Virtual Knowledge Environments

The third level of add-on software would create options for specialized library rooms and multi-media environments. For example: an Elizabethan-style Shakespeare Room could provide a superb library collection on the shelves, a bust of Shakespeare on the desk, a model of the Globe Theater on a side table, a DVD and film library with two screens to compare performances from different productions, etc. Lovers of detective fiction could have a reconstruction of Sherlock Holmes' study at 221-B Baker Street to house their favorite volumes. An American Civil War Room could include books and DVDs, and options for busts and Civil War photographs, display cases for uniforms and muskets, and areas for large 3-D displays of battlefields (all selectable, and changeable, by the user.)

These level three rooms could be especially useful for children. A child's Dinosaur Room could include pictures and 3D models of dinosaurs. Each elementary and secondary school subject could have its own age-appropriate Room, with its state-of-the-art instructional aides available to every child worldwide. And the Room's resources might be expandable or discoverable: For example, a Geometry Room for junior high school students could have a concealed door - a section of the bookcase could swing open - to lead down corridors to a Non-Euclidian Geometry room, and an N-Dimensional Geometry Room, and even side passages to a Prime Number Room, each with contents ranging from basic materials to the most advanced, current, thinking. Local school systems could organize and provide online resources to their students, including links to available tutors (who might be in another country) who can offer assistance.

Level 3 modules also could include a universe of specialized offices and workstations for different professions. A biomedical researcher's office could include the current and back copies of basic journals and a large television screen and Internet TV Guide with access to online biomedical conferences worldwide. Desks also could be equipped with workstations, like the Bloomberg Terminal for financial analysts, with organized pull-down menus, real-time information and time series data, and productivity-enhancing tools.[9] It would be easy to imagine exciting workstations for Composers or for Art Historians that would access Internet resources quickly and easily and increase productivity. Organizations could create their own specialized rooms and workstations – for example, a UN Scholars workstation; or local public libraries could simulate their Reference Rooms in software; or international organizations like the Catholic Church could organize a world of online resources to support their members (i.e., www.christusrex.org is an example of extensive resources that could benefit from a next-generation user interfaces)

II. Additional Steps and Services

- Re the potential income from these ideas: If (on a global scale) even 20 million users in developed countries spend $50 to purchase and upgrade levels 2 and 3 modules, the income is $1 billion.[10] [11]

- For the Global Public Library, one of the unanswered questions is how royalties will be

[9] See the entry for Bloomberg terminal in www.wikipedia.com.

[10] The use of file cabinets for articles and reprints could be straightforward. Adding an article would cause a 1/3 tab manila folder, with appropriate heading, to be inserted automatically into the file cabinet, with the tabs on following folders adjusted to maintain their readability when the file drawer is opened. The basic filing would be alphabetical, but there could be many other options (e.g., color coding or chronological) available for higher-level modules.

[11] It seems likely that Amazon, Google, or others also will provide print-on-demand services for out-of-copyright books. Early estimates from the Internet Archive Bookmobile project (www.archive.org) suggests a typical text-only book can be produced with a specialized Xerox machine and soft bindings at a wholesale price of about $1/volume.

paid for reference books, current periodicals popular fiction, and other works covered by copyright if these costs are not wholly covered by the advertising revenues to Google, Amazon, and other participating companies. If needed, this software offers an attractive further option: users can register their software with their local public library system. These local public library systems can, in turn, serve as purchasing agents to pay annual subscription fees for their registered card holders – thus, needed payments can be made while preserving the principle that knowledge and information should be free to individuals.[12]

- My discussion stops at Level 3 software. But it would be easy to imagine Level 4 and higher-level options. For example, in the Middle Ages a scarcity of books focused attention to the art of memory and the use of the imagination to create entire "memory palaces," with myriad rooms for each branch of knowledge and numerous images and icons within each room to stimulate memory.[13] (Thus, the study of Persian poetry might evolve into an imagined Persian garden with great poets greeting the visitor and speaking their poetry.) By this standard, the somewhat book-oriented interface that I have described may only be one of many delightful and engaging options. Across the decades, beginning in the school years, an individual might want to build a palace of many rooms (and gardens) with a broader design that can be simulated in software.

[12] Concerning royalties: the rule might be that a library system can "lend" for simultaneous use only as many digital or physical copies of a book or magazine/journal as the number of physical copies that it owns– i.e., while dozens of users might have the icon on their desktop, if there are three physical copies in the system and one is checked-out physically, only two users could have immediate free online access on their desktop PCs. Beyond this point, if they do not want to wait, users could pay a modest per-volume charge or an annual subscription fee (to be negotiated) to purchase rights to one "virtual" copy of all books.

Concerning the annual subscription fees for public library systems: Sampling, similar to the system for paying royalties for the music played on radio stations, would permit royalty payments to publishers and authors. It seems reasonable, since so little revenue would be involved, to waive all user fees for public library systems in underdeveloped countries.

[13] Jonathan D. Spence, The Memory Palace of Matteo Ricci (New York: Penguin, 1984). See also Mary Carruthers, The Book of Memory: A Study of Memory in Medieval Culture (NY: Cambridge University Press, 1990).