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The Fully Electronic Library; the Swedish Project

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The Fully Electronic Library®
The Swedish Project

"So let us think kindly of those who would frighten

us by slogans and catch-words about the great and

growing mass of the world's literature, and of those

who would take pity on our benighted state to solve

all of our problems with machines they have not yet

thought about." (1)

Introduction

While historically most libraries began as collections of "books" in a single format, almost every library, sooner or later, has been faced with the problem of how to handle information in other formats. A library of tablets had to deal with scrolls; and then a library with scrolls had to deal with codices. As new information formats, like motion pictures and sound recordings, emerged in the early 1900s, many libraries were reluctant to add such unproven technologies to their collections. But by the end of the twentieth century almost all libraries had enthusiastically embraced a full range of new technologies while still maintaining sizeable book collections. Most libraries are still challenged by the necessity to handle materials in a wide variety of formats assisted by a wide variety of machines of one kind or another. It has been difficult for libraries to achieve even a portion of the real cost savings that information technology might offer; instead the cost of new information technology is an addition to, not a substitute for, existing costs.

Almost from the emergence of the codex, inventions to assist with, or convert, the information in books have been proposed, developed, and sometimes even used with one degree of success or another. Ideas such as Ramelli's scholar's book wheel (2) have regularly appeared and just as regularly disappeared only later to be recalled as interesting anomalies. In the past fifty years, after a slow developmental phase, computer and information technology has, truly transformed libraries. Vannevar Bush's landmark 1945 article "As We May Think," (3) in which he proposed a scholar's workstation called Memex, foresaw the changes that were to come.

The Molesworth Institute, which was founded in the mid-1950s just as library automation burst on to the scene, has been one of the chief commentators on various aspects of the more arcane and fanciful library applications. (4) The research staff of The Molesworth Institute watched with particular interest various proposals in the late 1960s by scientists with only a dim view of the true nature of libraries who predicted that by 2000 a computer based national research library would replace academic libraries. (5) It also took note of F. W.Lancaster's groundbreaking 1978 book **Toward Paperless Information Systems** (6) that suggested that by 2000 we would be living in a paperless society.

Creating a Library for the 21st Century

In December of 2000 The Molesworth Institute was commissioned by the Board of Trustees of the newly established Ezra Beesley University in Baxter to develop a plan for the creation of its library. The Board emphasized from the start its desire to create a library that would match its plans for a unique institution for the 21st century. EBU, which will enroll its first students in 2007, will have a full range of undergraduate,

graduate, and research programs. By 2012 EBU is projected to have an enrollment of approximately 20,000 students, over 1,200 full-time faculty, and to be awarding at least 200 Ph.D. degrees annually. EBU will emphasize cost-effective applications of computer and information technology in all aspects of the institution's operations with a view to significantly reducing costs, especially to students, while substantially improving their education. No textbooks will be used in the instructional program thus saving the average undergraduate student more than SEK 75,000 over four years. Similar savings have been mandated in all areas including staffing, buildings, and administration. While EBU is committed to becoming a major, fully accredited, and nationally recognized institution within ten years, it also is committed to avoiding major startup and operating costs. EBU is constructing its own wind farm that will provide all of its electricity. It is also in the final stages of negotiation with Cray Computers to adapt that company's supercomputers to manage all of the institution's information and research needs. Other emerging technologies such as RFID (radio frequency identification) smart minicomputer-like identification cards, Intel's dual-processor semiconductors and 64-bit chips, and LCoS (liquid crystal on silicon) television screens will be fully utilized as they become available.

Recognizing the daunting challenge of building a major academic library, the research staff of The Molesworth Institute realized that it needed to expand the normal practice of relying solely on its own creative imagination. Thus a number of Fellows of The Molesworth Institute were invited to participate in planning discussions that were held at the Institute's Spring Hill Conference and Research Center in Storrs, CT from

April 1 to 15, 2004. **No Books, No Paper©; The Fully Electronic Library™**, the full report of those discussions, is available at http:www//molesworthinstitute/nobooks/☺.

The first several days of the planning sessions were devoted entirely to non-structured, open-ended, free-ranging discussions in which each participant was assigned at random 15 minute blocks of time during which he or she could comment on any aspect of what this new library might look like. No visual or written presentations were allowed, there were no flip charts or blackboards available, and no one was allowed to use or take notes of any kind. Our initial goal, which proved to be by far the most difficult part of our work, was to define the basic concept of a truly new academic library for EBU and the 21st century. There was immediate agreement that the purchase of the book collection of a failing college or university, or any other large-scale acquisition of books was neither feasible nor necessary. After prolonged discussion there was unanimous agreement that the EBU Library should contain no books and be entirely paperless. The fully electronic Edmund Lester Pearson Library, which is now under construction, will be substantially less expensive to build and maintain than any other conceivable academic library. At the same time the faculty, staff, and students of EBU will have immediate access to a range of information that equals or surpasses that available in all but a few of the most prestigious academic libraries in the world. The ELP Library will embrace the historical idea of a library as an institution that deals solely with the dominant form of information and thus will avoid the inevitable complications of attempting to manage a bewildering array of outmoded information formats including books.

Towards the conclusion of the meeting, the Italian and Swedish representatives asked if they could adapt the concept and plans for the ELP for use by emerging

institutions in their countries. Permission to do so without any fees, in recognition of their contributions to the planning effort, was readily granted. It was also agreed to establish a licensing program, with only modest fees, for other institutions in the United States and elsewhere that wish to develop a Fully Electronic Library.®

The Swedish Project

Shortly after the initial meeting, the Swedish delegation learned of Swedish government plans to establish in 2008 Torgny Lindgren University, whose projected size and enrollment will be remarkably similar to those of EBU, at Missenträsk in Västerbotten. Thanks to hard work on the part of our delegation the powers-that be were persuaded to adopt the Fully Electronic Library® as the basis for the Pelle Svanslös Library that will serve as a centerpiece for TLU and that will become a member of BIBSAM and which has already been designated to become the National Electronic Research Library in 2010. The remainder of this article, which deals specifically with the Svänslos Library, is based on an article describing in more detail the ELP Library at Baxter University that appears in the January 2006 issue of the American journal *College & Research Libraries*.

A Further Definition

The Svänslos Library, like its American prototype, will contain no printed books, or other printed materials of any kind. Those constraints will apply to book substitutes (e.g., microforms) and other information formats that require specialized mechanical equipment (e.g., films, sound recordings, and videos). No one, including staff, will be allowed to bring any of those materials into the library. All information resources will be available only in digital formats and accessible only electronically. Paper will not be

allowed within the library. There will be no photocopy machines, no computer printers, no provision for the receipt of mail (the library will not have a mailing address), and no wastebaskets or recycling bins within the library. Neither staff nor users will be allowed to bring any of those materials into the library. That rule will be strictly enforced and contraband will be seized at the entrances and destroyed on the spot. Only personal data assistants, computers, and other paper-free electronic devices may be used to bring information into, or take information out of the building. This will require users and staff to use their imagination rather than simply to print out copies of information to take home that they will never look at. Hot air dryers, not paper towels, will be standard in the unisex restrooms that will also feature the Washlet toilet developed by TOTO that has a heated seat, a streamlined wand that provides a warm aerated flow of water, and a warm air dryer. (7)

Collections

Once the "no books, no paper©" decision was made, our discussions focused on the nature of the library's collections. Those collections will consist of an array of electronic resources equal to, if not greater than, those currently available in all but a few of the world's largest research libraries. Any and all resources that can be accessed by computer, whether through the internet and the world wide web or in databases that can be loaded locally, will be available through an assortment of computers in the library and, as contractual arrangements allow, to qualified users on campus, at home, or at other locations. Google's project to make available full text digital versions of an enormous number of books held by major research libraries reinforced the wisdom of our collections decision. Existing and emerging electronic information resources will more

than meet the needs of faculty, staff, and students while fully meeting the governmental requirements for library resources. An annual information access budget of approximately SEK xxx will be more than adequate for the foreseeable future; [comparison Lund and Uppsala].

A true research library must contain special collections that will make unique resources available to faculty and students while adding to the overall store of information available to the world's research community. To that end the Svänslos Library will build a comprehensive database of all electronic resources created within Västerbotten from January 1, 2001 onwards. Major funding from a small group of local philanthropists has established an endowment fund of 7,500,000 SEK the income of which will support the development of the Västerbotten 21st Century Electronic Archive (V21CEA). This archive will contain: (1.) Anything created electronically, printed, published, or written by a resident or native of Västerbotten; (2.) the content of all websites based in, created in, or that mention Västerbottten or provide information about activities, associations, companies, institutions, organizations, or people associated in any fashion with Västerbotten; (3.) local programming, including advertising, created or broadcast by local media outlets; (4.) the records of all associations, businesses, institutions, and organizations located, or with a major presence, in Västerbotten; (5.) initially on a cost basis, the correspondence, photographs, and other personal papers of any resident of Västerbotten; and, of course, all aspects of research, published or unpublished, carried out by alumni, faculty, staff, and students of TLU. The emphasis will be on information created on or after January 1,2001. Electronic records from any date will be included, and efforts will be made to encourage and support the digital

conversion of non-electronic information sources created before January 1, 2001. Paper and other non-electronic information resources suitable for V21CEA created after January 1, 2001 will be digitized in a special off-site location. A dedicated computer will be programmed to monitor the updating of websites and other electronic resources relevant to the scope of V21CEA and create an electronic archive; minor additions or deletions may simply be noted but a complete version of each website will be archived whenever a major update occurs, or at least annually.

The Library That Never Sleeps

The Svänslos Library will be closed only on February 29th so that it can operate 365/24/7©. That schedule recognizes the fact that information providers, and remote users, may be located anywhere in the world and that local users, especially during the long summer daylight hours in Västerbotten, may wish to use the library at any time. The staffing and service costs will be far less than those of a traditional research library. A substantial number of the positions needed in a traditional library, especially those in technical services, will be eliminated entirely. There will be no need for any acquisitions staff, catalogers, serials librarians, processing staff, preservation and binding staff, circulation or reserve staff, interlibrary loan librarians, shelvers, mail clerk, or security personnel.

A 365/24/7© schedule translates into 8,760 hours a year. Each staff member will work 40 hours a week for 46 weeks a year; that allows 6 weeks for vacation, sick leave, and the several holidays that may be taken to accommodate a staff member's national, religious, or other affiliations. To cover one position for an operating year will require approximately 4.75 people. The initial staffing, which is intended to remain stable as

enrollment reaches its peak, will provide 48 positions. That will provide 1 staff member for each 416 students.

There will be ten staff members on duty at all times the library is open. That will provide for staff with the following expertise: archives; arts and humanities; building and equipment maintenance; electronic technology; engineering; information science; instructional technology; sciences; social sciences; and business, law, or medicine on a rotating basis. There will be no administrative and managerial staff, no formal organizational structure to be changed at least every other year, few if any meetings, and no memos or reports to be written, read, ignored, and filed. All staff time will be spent on productive service oriented activities. The elimination of the meaningless chores performed in all academic libraries will represent, in itself, a saving of at least 19 positions.

In lieu of the traditional library director, an electronic Constant Consensus Companion (CCC) will allow all staff to share the required administration of the library, including communication with the university administration and external constituencies. All institutional and library policies and procedures, budgetary and personnel, files, accounting and reporting requirements, information systems controls, building management programs, and other required procedures will be managed through the CCC. All library staff will have equal password protected access to the CCC; and all of the library staff will be authorized to make decisions on behalf of the library. All decisions will be automatically organized and summarized and distributed via e-mail to the staff on a daily basis. Significant changes in policies and procedures will be highlighted in a central electronic file for two weeks. Not only will there be a substantial salary saving but

decisions will be expedited since staff will not have to wait for a library director to make up his or her mind, or wait for the director to return from one inconsequential national or international meeting.

Salary levels will reflect the shared administrative responsibilities as well as the productive professional responsibilities of the staff. The minimum starting annual salary will be SEK 375,000. The initial total annual salary budget will be SEK xxxxx [comparison Lund and Uppsala]

The Library Building

It would, of course, be possible to create The Fully Electronic Library® as a virtual library with no physical building. That was one of the most contentious issues considered by the research team. In the end there was unanimous agreement that a physical library building, which could be of a much more modest size than most contemporary university library buildings, was appropriate and necessary. Government agencies, for example, might well look askance at a university without a library building. It was also agreed that there must be comprehensive off-site access to the collections from other locations on campus, to TLU faculty, staff, and students wherever they might be, and to other potential users as contractual and operational considerations may allow.

The construction of a physical space:

(1.) Symbolizes the important traditional role of the university library as the "heart of the university" (8) as it has been expressed in a wide variety of quotations by hundreds of university chancellors for hundreds of years;

(2.) Provides a central place on campus to serve as an educational and social gathering place for faculty, staff, and students;

(3.) Allows a wide range of the latest information technology to be made available in a setting where assistance and instruction in the use of that technology and the development of information literacy skills can be provided to the entire academic community;

(4.) Provides access to specialized electronic information resources that for contractual, technical, or other reasons cannot be accessed remotely;

(5.) Furnishes quiet, isolated spaces that will allow users to concentrate while carrying out their research or studies; and

(6.) Establishes a central location for the concentration of all of the computer, telecommunication, and other electronic products and services that are at the core of the work of TLU and the PSL.

Construction will begin in the spring of 2007 and completed by the time TLU opens in the fall of 2008. A competition among the world's leading architects to design the PSL was considered but ultimately rejected because it was concluded that while a monumental building might attract attention, it would be frozen in time and incapable of handling the rapidly changing body of information and accompanying information technology. Instead the American-Swedish architectural firm of Hastings, Pudding, Randolph, and Salin, is adapting the design for ELP Library's simple, one-story, modular building, which will take advantage in every respect of the most current technology while making a statement about the nature of the library, to house the world's second Fully Electronic Library.® Since no space will be needed to house a massive book collection and the attendant staff, services, and support activities, the just under 100,000 square meter building will handle up to 5,000 users at any one time.

Located in the exact center of a radial campus, there will be an entrance/exit portal of approximately 14 meters on four alternating sides of the 100-meter wide octagonal building. Each portal will be connected via a walkway and an enclosed domed of approximately 23 meters arcade to an adjacent classroom/office building. The arcade that connects to the main classroom building will feature a changing moving sound and light show similar to that of Viva Vision on Fremont Street in Las Vegas, Nevada. (9) The exterior of the building will consist of translucent polycarbonate panels to allow for a completely mutable appearance. Using a sophisticated projection system the exterior walls can be made to resemble traditional brick, dressed granite, adobe or any other substance. Alternatively the building can be made to resemble another great library, such as the Royal Library in Stockholm, or, for example, a landmark like the Gustav Vasa. Most often a substantial portion of the panels will display educational and informational images dealing with various aspects of information history using primarily collections from the archives of The Molesworth Institute including postcards of library buildings, quotations dealing with libraries, and postcards depicting books and reading. Faculty, staff, students, and other interested parties will be invited to develop appropriate visual displays for exterior and interior image screens. The ever-changing appearance of the exterior facade of the building is intended to convey the ever-changing information services found within the building. Discrete neon "No Books, No Paper©" signs will be located at each entrance to the building to reminds users that the library they are about to enter is not a typical academic library.

The main computers will be hardwired but as the building will be a wireless zone it will have no electrical outlets. Access to all systems will be through a campus-wide

wireless network. All of the building systems, including a robotic cleaning system, will be controlled through electronic keypads, which can be operated by the library staff either in the building or remotely, as part of an advanced system designed by Crestron Electronics. (10) All signs and notices will be posted on flat plasma display screens and the information on those screens can be changed through the building systems' electronic keypads. A series of voice, touch screen, or keyboard activated information kiosks programmed for more than a hundred languages, as well as access through headsets and tactile screens for the hearing or visually impaired, will be a key to access to the building's information resources. Those kiosks will provide visual and voice responses to basic questions such as the location of the restrooms, or the time and location of library programs. They will also display, upon request, a digital image of each library staff member that will indicate his or her current location in the library through an RIFD (radio frequency identification) system.

The informal way in which access to information will be provided allows for a variety of furnishing options for different settings and usages. Only a minimal number of traditional study tables and chairs will be provided. A wide variety of seating options including club and lounge chairs, soft foam cubes and bean bags, bar stools and high tables, and hammocks will be offered so that each user can find a physical setting conducive to his or her individual comfort and taste. The American and Swedish architects are working closely with a variety of contemporary Swedish designers to develop a new range of library furnishings suitable for a new environment.

There will be no fixed office space as, for the most part, staff will be working at a variety of locations within the library and, except for storage of personal items, will have

no need for an assigned desk, bookcases, or the other accoutrements of a typical library office. In addition to a wide assortment of computer workstations set in various informal arrangements, the library will contain a range of open spaces that can be reconfigured as needed, using visual display and other panels, to provide classrooms, discussion spaces, or other educational, instructional, or lecture areas. The greatest possible flexibility has been provided to accommodate the enormous changes in the availability of technology, information resources, and systems that are sure to come even before the completion of the building. The building design team continues to meet electronically with its American counterparts at least every other week to review information about emerging technological concepts and systems with technical staff from Cray, Crestron and a wide variety of information providers like Google. While the building will be completely handicapped accessible, and all systems are being designed to be readily accessible to staff and users with any kind of disability, one area of special interest is technologies, including possible direct machine to brain links, that show promise of further reducing, and perhaps eliminating entirely, any barriers to equal access to information for all. The sketch of the library layout accompanying this article will not, in all likelihood, represent the opening day layout; it will certainly not represent the layout within a year after the building opens. For those reasons it provides only minimal details.

Security

Physical and electronic security is a major concern given the open nature of the building, the portability of much of the equipment, and the nature of our contemporary information society. A sophisticated electronic, holistic, redundant security system known as KAFKA® (the meaning of the acronym is a trade secret) will protect the ELP.

It will use electronic, physical, and visual means of protection that are capable of instantaneously inflicting a variety of appropriate punishments or restrictions on miscreants. The details are a closely guarded secret and neither the offenses nor the punishments will be made public. Appropriate warnings will appear at random intervals on all system screens. Users beware! Unspecified punishments may even be meted out at random whether or not a user has done anything wrong. It may even be that KAFKA®, like the Svänslos Library itself, is simply a figment of our imagination. Or its central space may serve, as some who are familiar with the children's room at the Malmö Public Library have suggested, another purpose.

Mousers in Musty Books No Longer

"The time was when a library was very much like a museum, and a librarian was a mouser in musty books. … The time *is* when a library is a school, and the librarian is in the highest sense a teacher." (11)

Since Dewey first put forth those immortal words more than 125 years ago, librarians have struggled to change their image by eliminating the notion that they are "mousers in musty books" as they have sought to become teachers in the truest sense of the word. The very concept of a library – a term that must be retained to describe a collection of information, even one without books, in whatever physical shape or intellectual form it may take - as "an enormous mind… [that] is hoarded beyond the of any single mind to possess it" (12) – and of a librarian must focus on the idea of teaching users to unlock the increasingly enormous and complex store of information available in the world's libraries by assisting users in every way possible to find the information, no

matter how obscure, that they seek for any purpose no matter how important or trivial. The Fully Electronic Library™ offers the best prospect for success in such endeavors.

Although, for the moment, the Pelle Svänslos Library may be only a fantasy, it will soon be possible to create an electronic library that, without any books, could come close to Ptolemy I's dream of assembling at Alexandria a universal library containing all known knowledge. The resources of such a library could easily equal, and probably surpass, those of the world's current major libraries combined if not in physical form, scope, or size than in terms of easier access to the entire world's store of information. Such a library could also serve to provide access to that information to a world population far exceeding that which even the largest libraries now serve.

The Molesworth Institute's Library Research and Planning Team

Ted E. Behr, Curator of Artifacts

Göran Berntsson, Swedish Fellow

Cecily Cardew, Librarian

Chelsea Flower, Director Designate

Michael Gorman, Fellow

Bengt Hjelmqvist, Senior Swedish Fellow

Rossana Morriello, Italian Fellow

Timothy Peason, Assistant Librarian

Octavia Porter Randolph, Architectural Fellow & Scribe

Nouleigh Rhee Furbished, Preservation Officer

Norman D. Stevens, Director

Jackie Urbanovic, Institute Artist-in-Residence

Footnotes

(1.) Ralph R. Shaw "From Fright to Frankenstein" *D. C. Libraries* 24 (Jan. 1953): 10.

(2.) Agostino Ramelli*The Various and Ingenious Machines of Agostino Ramelli*

Baltimore: Scholar Press and Johns Hopkins University Press, 1976.

(3.) Vannevar Bush "As We May Think: Atlantic Monthly 176:101-8, 1945

(4.) Norman D. Stevens *Archives of Library Research from the Molesworth Institute* NY:

Haworth Press, 1985.

(6.) F. W. Lancaster *Towards Paperless Information Systems* NY: Academic Press, 1978.

(7.) http://www.washlet.com

 (8.) The notion of building a hear-shaped library was considered but rejected as being

impractical although romantic.

(9.) http://www.vegasexperience.com

(10.) http:://www.crestron.com

(11.) Melvil Dewey "The Profession" *American Library Journal* 1 (Sept. 1876):5-6.

(12.) Virginia Woolf *Jacob's Room* NY: Harcourt Brace, 1922 p. 7.