The Future of the Library

By Eli M. Noam and Caterina Alvarez

In our lifetime, libraries will face a tremendous crisis. The cause this time is not penny-pinching politicians or indifferent students, but information technology. This may seem surprising. Don't we live in the "information" age, with libraries one of our key institutions? The ever-expending capacity of information technology is forcing us to assess the future potentials of the library. Does technology threaten or provide opportunities?

It has been more than 5000 years since scholarly activity began to occupy a tenacious niche in civilization. Ancient Egypt produced the first known mediums of institutionalized information storage in the form of temples. Oral tradition did not prove foolproof and writing emerged, which led to formal information storage establishments—libraries. Rapidly, they became extensive. The royal library of Ninveh stocked over 10,000 works; documents were arranged in different rooms by subject, much as they are today. Scholars congregated in these rooms, surrounded by their disciples – the university system was emerging.

The model of the ancient library—centrally stored information, scholars coming to the information, and a wide range of information subjects under one institutional roof—was logical when information was scarce, reproduction expensive and restricted, and specialization low. It became also the model for the most formidable of knowledge institutions of antiquity, the Great Library of Alexandria. This model supported for a haven community: scholars came to the information storage and produced collaboratively still more information there and students or any persons seeking information came to the scholars.

But progress in information institutions was not steady. The Dark Ages in Europe discouraged learning. St. Augustine advised: "This is the disease of curiosity…it is this which drives us on to try to discover the secrets of nature, those secrets which are beyond our understanding, which can avail us nothing and which man should not wish to learn…" But by the late Middle Ages, with economic prosperity on the rise again, information production expanded, the university was reborn, and with the modern research library. It has been moving forward and upward ever since, and in time, reached a broad-based community presence in the form of public libraries.

But now, the role of libraries is challenged by the improved ability to store information electronically, and to reach such information from distance. At the same time, the cost of acquisition has been rising exponentially. In 1940, Chemical Abstracts cost $12 a year, in 1977 $3,500, in 1995, $17,400. And the production of information grew at such that the store of human information doubles every 10-12 years. There are at least 80,000 scientific and technical journals, and 1,500 scientific abstracting periodicals. *Chemical Abstracts* took 31 years (1907to 1937) to reach its first one million abstracts. The second million took 18 years. The most recent million took only 1.75 years. Thus, more articles on chemistry have been published in the past two

years than in human kind's entire history before 1900. Therefore, complete collections are not sustainable economically or organizationally. Comprehensive library collections are increasingly unaffordable outside of a handful of national libraries that leverage copyrights protection into free acquisition. But at the same time, electronic alternatives became powerful in storage, broad-ranging in content, and efficient in retrieval. Electronics can rescue the strange function of the library. But will they in the process make the library irrelevant?

Today, electronic worldwide connectivity, originally a culturally esoteric and technologically unorganized experiment, has become a mainstay to reach information. By 1997, worldwide usage of online services exceeded 35 million people, a 35-time increase in a decade[1]. At that rate most of the world's knowledge will soon be online.

As this happens, research libraries are gradually shifting from physical presence of information to the creation of electronic access. It is a logical response, but it undermines the fundamental need for the library as a physical location for specialized information. One response by libraries to the improved information technology available outside is to adopt it inside. The New York Public Library engaged in a five-year, $100 million project for a new Science, Industry and Business Library with an Electronic Information Center. But not many libraries can match this effort.

As this happens, electronics try to adopt the comfortable feel of traditional libraries and books. NEC's net-based virtual "Universal Digital Library" uses screens to lead the
reader through a library, guided by a librarian who helps in accessing contents and finding network-linked sources.

We are also on the verge of creating electronic books. By using billions of reversible "digital ink" particles made of indium tin oxide that are individually encapsulated, and coated with a grid made up of thousands of lines of flexible, transparent conductive ink, "digital paper" is created. Bound like a book and network-linked, this portable tome enables access of knowledge anytime, anywhere. The feel of a book with the access power of a computer!

A second strategy is *specialization.* As the body of knowledge grows, the evolution of fields of expertise continues into ever-narrower slices. Libraries move to specialized collections rather than an all-purpose role. But there is a cost to this specialization. Nietzsche mocked it a century ago. "A scientist was examining the leeches in a marsh when Zarathustra, the prophet approached him and asked if he was a specialist in ways of a leeche…O, Zarathustra,…that would be something immense; how could I presume to do so!…That, however, of which I am master and knower, is the brain of the leech; that is my world!…For the sake of this did I cast everything else aside, for the sake of this did everything else become indifferent to me…"[2]
Also, specialized materials are often unique, and that may make them too valuable for ordinary handling. The solution: electronic storage. Digitalized, a third century Roman declaration of war can be accessed electronically while its artifact remains protected. Interconnected, it becomes available to the world. But are these then the future libraries, as specialized data banks linked to each other? The answer is a hopeful no.

Why Libraries will Remain Important?

Libraries are not only about information. They are also about people. Community, to commune, to

communicate—the terms are related linguistically as well as functionally to each other, to togetherness, to exchange. This is true for the library of our childhood, our college years, or our professional specialty.

Libraries, as James Billington eloquently states, were "temples of pluralism, places where a great diversity of people gathered. Individuals with conflicting points of view sat peacefully next to each other in the reading rooms just as books with conflicting points of views stood quietly next to each other."[3] Since Andrew Carnegie built the great library system in towers and cities across America they have served as a unifying force, a communal tribute to the culture and values of the community and to the value of learning. The aspect of community is a main reason why the library will not be swallowed by electronics. The importance of the community aspect can be seen by the success of large bookstores, which provide a meeting ground for people with interest in books, ideas, and companionship. The more impersonalized the world of information becomes, the more important becomes institutions that create the human element. Libraries have always catered to this need, but they now must make it still more central.

A second reason for the library is that electronic connectivity is not cheap. Libraries serve the economically disadvantaged or those without technical literacy. It is true that the hardware is getting cheaper all the time, but the applications are also becoming more advanced, and require still more advanced hardware. It will always be cheaper to share than to own, and that fundamental principle for the economics of libraries will remain.

Thus although it is true that computer owning individuals need not enter a library to access vast stores of information, costly equipment and modernized research skills make it necessary. Easy technical availability does not translate into easy economic or skills accessibility. And this leaves a major role for libraries. The library will no longer be a place to only find information but to learn how to find it. Librarians also with search techniques will be at vital part of the library making it navigable to the inexperienced user.

The fourth role of the library is to function as a filter for information. The real loss in an open electronic system is not due to a decline in the quality of a given communication, but rather due the decline in information, and that it is unscreened as to quality. Information is not cost-less to the receiver. Too much information is almost as bad as not enough of it. Libraries must continue to play a screening function in the form of information consultants to users, and as experts in search tools, add a dimension of quality assessment, which automatized tools sadly lack.

Conclusion:

In the past, people came to the information, and the information was at the library. In the future, the information will come to the people wherever they are. What them is the role of the library? We have argued that *storage* is the lesser of its functions, in contrast to the past. Instead, it is *community; equitable access; new literacy training;* and *quality screening.* None of them are new, but the emphasis is different. The real question: can libraries reform themselves or must things get much worse first?

[1] Arnold, Stephen E.; Arnold Erik S. *Vectors of Changes: electronic information from 1997 to 2007,* Information Access Company, 1997 Online Inc.

[2] Nietzsche, F. W., *The Complete Works of Fedrich Nietzsche,* Vol. 11, Thus Spake Zarathustra, London: T.N. Foulis, 1909, pp. 301-306

[3] Billington, James H. *"Libraries, the Library of Congress, and the Information Age."* Daedalus, Journal of American Academy of Arts and Sciences, Vol. 125, No. 4 Fall 1996