

## LIBRARIANS AND USER PRIVACY IN THE DIGITAL AGE

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### Abstract

Innovative, digital information programs have been launched involving libraries around the world. These programs permit people to satisfy their information needs regardless where they, the information resources they need or the information specialists whose assistance they need to utilize those resources, may be; or, for that matter, the time of day when those needs arise. They utilize the latest communication technologies, including Instant Messaging (IM). IM permits real-time, interactive consultation with the information professionals best able to deal with particular information needs. These programs are exemplary manifestations of knowledge management principles. Global, digital reference services combined with a growing body of machine readable information and high speed, readily accessible communication networks are bringing the concept of the virtual library, if not to complete realization, then surely within reach.

However, in the US and in many parts of Europe surveillance laws and the primacy accorded intellectual property threaten to undermine the promise and efficacy of this emerging, global library, information and knowledge resource.

This paper explores the potential and promise of the knowledge resource that digital information sources make possible, and the legal and social impediments that threaten the full realization of that promise.

### Keywords

Virtual libraries, digital reference, knowledge management instant messaging, individual privacy, RFID, peer-to-peer communication, intellectual property.

### 1. Introduction

Advances in technology; and the demands of economics, politics, business, and scholarship have focused new attention on information and those who help to find and utilize it. The specialized knowledge librarians have concerning the sources of this newly prized resource and familiarity with the tools needed to discover and to exploit it have given librarians enhanced prominence and visibility.

Electronic technologies and the rapidly growing store of information in machine interpretable form implies that users can have access to information resources regardless where they or the information they seek are located. A manuscript from an archive in Seville, Spain—if it has been digitized—is as accessible as is a locally held book, periodical or electronic database.<sup>1</sup> A story in a national newspaper or magazine is no less accessible than is a story in a local newspaper—unfortunately, in the US because of media consolidation it is often the very same

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<sup>1</sup> Digital preservation technologies and hybrid libraries, *Information services & use*, 22(4) (2002), pp. 159-174.

story. Fortunately, for the present, at least, the Internet allows access to numerous sources that don't fall under the control of media conglomerates.

As a consequence of the growing body of information in electronic form information seekers have access to an expanding universe of information. In addition to the local collections of materials that librarians acquire and develop, library users increasingly have access to an even larger, *shadow collection* of materials that are not locally held. Materials from these *shadow collections* can be instantaneously retrieved from myriad, distant repositories with the aid of a world-wide communication network (the World Wide Web), and the computerized systems that librarians have put in place.

However, electronic information systems don't just deliver information to users; they also collect large quantities of information associated with users' interaction with the system. These data are collected for accounting and assessment purposes and often as an ancillary byproduct of their operation. These data can individually or in the aggregate compromise users' privacy. Hence, ethical stewardship of these data is rapidly becoming an important new responsibility of librarians.

The USA PATRIOT Act,<sup>\*</sup> which was made into law in 2001 in the United States, gave the government broad powers to intercept communication and to gain access to personal information including business *and library records*.<sup>2</sup> The Act was due to expire after 10 years, in 2011, but it was extended for another 4 years until 2015.<sup>3</sup> Attempts were made to protect library records, but they were defeated.<sup>4</sup> Forefront among the organizations and groups opposing this legislation has been The American Library Association.<sup>5</sup> In fact, the only successful challenge to provisions of the PATRIOT Act was by a library consortium in Windsor, Connecticut.<sup>6</sup>

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\* The name of the Act is, in fact, a tortured acronym, "Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism".

<sup>2</sup> American Library Association, The USA PATRIOT Act, <http://www.ala.org/ala/issuesadvocacy/advocacy/federallegislation/theusapatriotact/index.cfm>

<sup>3</sup> Obama "autopens" Patriot Act extension into law: President authorizes use of machine to put his name on legislation extending anti-terror surveillance powers, CBS News.com, 26 May 2011, <http://www.cbsnews.com/stories/2011/05/26/politics/main20066686.shtml#ixzz1NhEbxkDP>

<sup>4</sup> ALA Washington Office, District Dispatch: news for friends of libraries, Congress renews USA PATRIOT Act without needed reforms, Posted on May 27, 2011, <http://www.districtdispatch.org/about-district-dispatch/>

<sup>5</sup> <http://www.ALA.org>

<sup>6</sup> Plaintiffs Win Round in Lawsuit on Patriot Act *New York Times* (nytimes.com), 10 September 10 2005, <http://www.nytimes.com/2005/09/10/nyregion/10library.html>

The sort of personal information collected by library information systems can reveal a great deal about a user's interests that may be of great value to commercial organizations. For example, someone who has accessed information about some distant place or checked out travel books may be a good prospect for a travel agency; someone who has accessed information about automobiles may be a good prospect for an automobile dealer or a bank offering automobile loans; someone who has recently accessed information about football teams or scores might be a good candidate for a subscription to a sports magazine or to purchase tickets to an upcoming match; etc.

Collecting, buying, aggregating, and selling analyzed personal information has become a major industry in most developed countries. The 21 March 2011 issue of *Time*—an international, weekly news magazine—featured a cover story, “Your data for sale.”<sup>7</sup>

## 2. Digital Reference

Electronic sources, if they can be identified, can be instantaneously retrieved, but the most appropriate materials are often not so readily discovered or located. Nor, can all information needs be completely satisfied with electronic resources alone. An effective information system (virtual or real) needs skilled information specialists and access to the traditional collections that libraries have been amassing for centuries. Thus, a number of digital reference services have begun to appear.<sup>8</sup> E-mail (and telephone) reference have long been available. It is estimated that more than 1,000 libraries world-wide offer virtual reference services.<sup>9</sup> The major difference in the programs now emerging is that their communication networks do not simply transmit questions and responses, *they support collaborative activity*. Thus, users have access not just to the information specialist who happens to receive his or her query or the human and information resources of an individual institution, but to an entire, collaborative network of people and resources. The electronic traces left behind as a consequence of the use these extensive networks can tell someone who is interested a great deal about the individual who initiated a query or a series of queries.

<sup>7</sup> JOEL STEIN, Your data for sale, *Time*, 21 March 2011, 40-6.

<sup>8</sup> JOE JANES, Live reference: too much, too fast? *Netconnect* (supplement to *Library journal and School library journal*).

<sup>9</sup> RICHARD M. DOUGHERTY, Reference around the clock: is it in your future, *American libraries*, 33(5)(May 2002): 44-46.

At present there are at least a score collaborative reference services world-wide.<sup>10</sup> The oldest and best known, digital reference service is the Internet Public Library.<sup>11</sup> Probably the best known is the Collaborative Digital Reference Service initiated by the US Library of Congress.<sup>12</sup> The CDRS was a pilot project the operated from spring 2000 until June 2002 when it included 260 participating libraries.<sup>13</sup> CDRS was superseded by the Library of Congress's *Global Reference Network* and *QuestionPoint*, a joint project of the Library of Congress and OCLC.<sup>14</sup>

The *QuestionPoint* program includes the development and promulgation of *best practices guidelines*, the development of profiles of the reference strengths of participating libraries, the development of a knowledge base derived from previously answered questions and algorithms to utilize the knowledge base to provide automatic responses to questions. *QuestionPoint* embodies many of the attributes of a well-developed knowledge management (KM) system. Participating library profiles function much like *corporate yellow pages* employed by many KM systems.

### 3. Instant Messaging

*QuestionPoint* as well as many other digital reference services make use of Instant Messaging (IM) technology.<sup>15</sup> IM is essentially real-time e-mail, i.e., each participant's messages are delivered immediately and the recipient can respond immediately. Consequently an interactive dialog can be readily carried on. This capability mitigates the shortcomings of digital reference service in which queries or reference interviews must be conducted at a distance. Some chat programs allow multiple contributors to participate in an interactive dialog, thereby supporting various sorts of collaboration. But, chat systems generally create and maintain detailed logs of the interactive session.

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<sup>10</sup> LiveRef(sm): A Registry of real-time digital reference services, <http://www.public.iastate.edu/~CYBERSTACKS/LiveRef.htm>

<sup>11</sup> The Internet Public Library, <http://www.ipl.org/>

<sup>12</sup> Library of Congress, Collaborative Digital Reference Service, <http://www.loc.gov/rr/digiref/>

<sup>13</sup> Library of Congress Global Reference Network, Project history, <http://www.loc.gov/rr/digiref/history.html>

<sup>14</sup> JEFFREY T. PENKA, The technological challenges of digital reference: an overview, *D-Lib magazine*, 9(2)(February 2003), <http://www.dlib.org/dlib/february03/penka/02penka.html>

<sup>15</sup> STEVEN M. CHERRY, IM means business, *IEEE spectrum*, 39(11)(November 2002): 28-32.

Instant messaging permits librarians themselves to become *virtual*. This has both advantages and disadvantages, and it certainly has potential for previously unimagined, new configurations of library and information services. Instant messaging permits library users to consult reference librarians even if they are unable to visit a library. Such assistance can even be provided during hours when the library is closed.<sup>16</sup> For example, CLEVNET based in the Cleveland Public Library has offers such a service.

The capability to offer real-time, digital reference service has more profound consequences than one might suspect. It brings the library and its services to users wherever they are. But, in addition, it also augurs a new, prominent role for librarians—or people with the skills of librarians. There are many instances in which individuals or groups engaged in academic or commercial projects would benefit from the exercise of the skills of a librarian. But, it is often impractical to interrupt work in progress in order to consult a librarian. Thus, one makes do with whatever information is at-hand. If a librarian could be reached as readily as entering his or her ID into an instant messenger's address window, then individuals and groups would without doubt avail themselves of professional assistance far more often than they do now.

#### 4. Reader Privacy

But, relying so heavily on modern communication technologies to deliver information services to individuals can raise a plethora of thorny problems not present when reference services were primarily face-to-face. Library information systems can invade the privacy of those whom a library is intended to serve. The data collected as a casual consequence of the operation of many systems can, in the wrong hands, create severe problems for innocent people. The systems that comprise a virtual library retrieve information from myriad sources. That information and the provenance of the information delivered to users also passes through the system. Computerized systems can create, and indefinitely retain, highly detailed records of the uses made of them—most users and even some operators of these systems

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<sup>16</sup> BRIAN KENNEY, The virtual gets real, *Library journal*, 128(15)(15 September 2003): 32-5, <http://libraryjournal.reviewsnews.com/index.asp?layout=article&articleid=CA320862&publication=libraryjournal> (accessed 13 October 2003).

might not even suspect how much information is being collected or how much can be deduced from that which is collected. A log detailing the sources library users have consulted and how they searched for them can be studied to provide valuable insights that may be used to design innovative, new services or to improve existing services; but they also might, if combined with other records, which are often intentionally or inadvertently maintained, be analyzed to reveal the users' identities, and clues to their thoughts, beliefs— and possibly, intentions. This may be a clear violation of an individual's right to privacy. Further, if those logs are interpreted in error or with bias, they can damn whoever left that electronic trace. Thus, librarians who specify and implement the technological infrastructures that comprise virtual libraries will have to be extremely sensitive to the manner in which system features are—or can be—used.

Unfortunately, in the US because of legislation such as the USA PATRIOT Act and older programs such as MATRIX—the Multistate Anti-Terrorism Information Exchange, which collects data from disparate sources and uses data mining techniques to find patterns and links among people and events—librarians drafting specifications for systems or enabling the logging capabilities of systems are obligated to look beyond the use they had intended to make of data they collect.<sup>17 18</sup> They must consider what some unknown agent might be able to know if the data had to be surrendered.

The standard response to such a threat is to ensure that any information that might identify a particular individual is stripped from logs before they are archived. This is a prudent and laudable precaution. However, that may not be enough. Data mining, i.e., techniques for discovering patterns and relationships among data that may not have been suspected or imagined at the outset, is now a very well developed art.<sup>19</sup> For example, the July 2003 issue of IEEE's *Spectrum*—an electrical engineering journal—notes:

“Someone with the ability to correlate large amounts of data—whether a business, health care provider, or government agency--might very well deduce more information from a system than was originally intended. ...

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<sup>17</sup> PAUL NEUHAUS, Privacy and confidentiality in digital reference. *Reference & User services quarterly*, 43(1)(Fall 2003): 26-36.

<sup>18</sup> Associated Press, Matrix plan fuels privacy fears, *Wired news*, 2 February 2004, <http://www.wired.com/news/business/0,1367,62141,00.html>

<sup>19</sup> GERALD BENOIT, Data Mining, *Annual review of information science and technology* (ARIST), 36(2002): 265-310.

“For example, consider an electronic transponder-based toll collection business. This business uses sensors at tollbooths to track transponders and calculate the toll due. At the end of the month, the business sends the driver a bill. Concerned about privacy, the company, while it sells records of transponder numbers, locations, and times so that others can analyze traffic congestion, never associates transponder numbers with customer names and never makes that information available.

“A credit card issuer, however, could buy that information and then correlate charges appearing on a customer's credit card with the cost of tolls incurred by the anonymous transponder number. By matching transponders with customers, the issuer can thus learn which customers are driving well over 15 000 miles per year and are good candidates for a low-interest-rate car loan. Here the correlation has completely bypassed the safeguards that the toll collection company thought it had in place.”<sup>20</sup>

I am not suggesting that libraries are likely to sell their log data to credit card companies or anyone else for that matter—though who knows what *might* happen. I cite the foregoing article simply as an illustration of the techniques available to those who wish to extract, or *mine*, data from a data store of personal information.

Karen Coombs, writing in *Computers in libraries* in 2005 offers some practical advice on developing a privacy policy and procedures to help protect user privacy.<sup>21</sup>

## 5. *RFIDs*

The matter is made even more complex by yet another intrusive development, *Radio Frequency Identifier Devices* (RFIDs). RFIDs seem to be replacing the barcodes that had become popular in supermarkets and libraries. RFIDs are tiny tags that contain a very small solid state chip and an antenna—the entire device can, in fact, be made “paper thin.”<sup>22</sup> The simplest of these devices are passive, that is, they must be stimulated by a radio frequency signal to cause them to radiate. When stimulated they transmit whatever data the chip was

<sup>20</sup> JAY WARRIOR, ERIC MCHENRY & KENNETH MCGEE, They know where you are, *IEEE Spectrum*, 40(7) (July 2003): 25.

<sup>21</sup> Protecting user privacy in the age of digital libraries, *Computers in libraries*, 25(6)(June 2005): 16-20.

<sup>22</sup> VTLS, RFID solutions, <http://www.vtls.com/rfid/> (accessed 11 October 2003).

programmed to hold or was most recently written to it. The principal advantages of these tags relative to simple barcodes is that they can be read without needing to be visible, i.e., the tags can be hidden in books or other objects, which also need not be visible. The items can be in someone's briefcase, purse or knapsack—intentionally or unintentionally concealed. They will still be detected if they pass within range of a compatible scanning device.

RFID reading devices can simultaneously read multiple tags, thus speeding checkout and return of materials. The tags, depending on sophistication, hold appreciably more information than a barcode can; and that information can be augmented or rewritten when materials are charged or discharged. In addition, the chips are not merely passive storage devices. The chips found in some RFIDs are, in fact, dedicated processors. They can encode data, execute protocols to send and receive data, and address memory embedded on the chip.<sup>23</sup> RFIDs can be read at, at least, modest distances. Customers of a supermarket in Rheinberg, Germany, Metro Future Store, were issued discount cards. But, these cards had embedded RFID chips. A German privacy rights advocacy group, FoeBuD e.V., found that, “[w]hoever enters the supermarket has to pass a gate with two huge antennas, and a computer can keep track of who has entered the store and bought what at which time.”<sup>24</sup>

RFIDs are of interest to librarians as a means to support various collection inventory activities, including circulation control, and self-checkout of library materials.<sup>25</sup> However, I must hasten to add that because of cost considerations the RFIDs currently in use by libraries are of the simplest, most benign sort.

Still RFIDs are solid state devices; hence, as applications proliferate, and the number of devices manufactured and sold increases, costs will decrease and sophistication will increase as it did with the computer chips with which we are already familiar.

The potential of this technology is enormous, though admittedly libraries—and even commercial enterprises—are still employing only its most basic and limited manifestations. Consider for a moment the following scenario that is described in an article published in the July issue of *IEEE Spectrum*:

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<sup>23</sup> JUNKO YOSHIDA, Euro bank notes to embed RFID chips by 2005, *EE Times*, 19 December 2001, <http://www.eetimes.com/story/OEG20011219S0016> (accessed 11 October 2003).

<sup>24</sup> FoeBuD unveils: Hidden spychips cover-up of Metro-Group's "Payback" customer cards, <http://www.foebud.org/rfid/pe-gb.html> (accessed 10 February 2004).

<sup>25</sup> *Ibid.*

“...Consider a scenario in apparel retailing. A woman walks into a dressing room carrying a dress. She tries it on and looks in the mirror. Meanwhile, a terminal in the corner of the room displays the dress with a variety of accessories. It has identified the dress using a pinhead-sized tag incorporated into the garment's label. This is exactly what Italian fashion designer Prada has operating in a dressing booth in a New York City store, where RF-ID tags are on all the clothing.”<sup>26</sup>

I have been assured by a representative of a major library system vendor in the US that their current implementation of this technology operates at frequencies that make reading at any appreciable distance unlikely and that in his company's implementation RFIDs hold no more information than is normally found on a bar code.<sup>27</sup>

RFID readers operating at 13.56 MHz have a *nominal* range from 25 cm to 40 cm.<sup>28</sup> However, the range at which signals transmitted by radio frequency emitting devices can be detected can often be improved considerably beyond that predicted by their designers. For example, Wi-Fi 802.11b Wireless LAN cards and Access Points are nominally designed for a range of less than 30 meters. Yet homemade antennas can achieve ranges of more than 30 kilometers.<sup>29</sup> And ranges of 1 kilometer have been achieved with antennas made from *Pringles* potato chip cans.<sup>30</sup> In addition, ranges of more than 70 kilometers more can be achieved with better commercial or homemade antennas.<sup>31</sup>

The capabilities of RFIDs are nothing short of fantastic. The European Union had considered embedding them in its new Euro notes.<sup>32</sup> As recently as May 2003 there were reports that the European Community Bank (ECB) was negotiating with Hitachi to supply chips to be embedded in Euro notes.<sup>33</sup> However, this project seems to have been postponed or delayed—

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<sup>26</sup> Warrior, et al, op cit., pp. 23-4.

<sup>27</sup> Private e-mail from Vinod Chachra, Chairman & CEO, VTLIS Inc.

<sup>28</sup> 13.56 RF-ID tag products, <http://www.rf-id.com/1356tags.htm>

<sup>29</sup> ROB FLICKENGER, A Wireless Long Shot, O'Reilly Wireless DevCenter, 05/03/2001, <http://www.oreillynet.com/pub/a/wireless/2001/05/03/longshot.html> (accessed 21 November 2003).

<sup>30</sup> ROB FLICKENGER, Antenna on the cheap (er, chip), O'Reilly Developer BOGS, 5 July 2001 05:20 PM, <http://www.oreillynet.com/cs/weblog/view/wlg/448> (accessed 21 November 2003).

<sup>31</sup> “7. Radio Tags - another Wi-Fi?,” RFID tag privacy concerns, <http://www.spy.org.uk/cgi-bin/rfid.pl> (accessed 21 November 2003)

<sup>32</sup> JUNKO YOSHIDA, Euro bank notes to embed RFID chips by 2005, *EE Times*, 19 December 2001, <http://www.eetimes.com/story/OEG20011219S0016> (accessed 13 October 2003)..

<sup>33</sup> WINSTON CHAI, Radio ID chips may track banknotes, *CNET News.com*, 22 May 2003, <http://news.com.com/2100-1017-1009155.html> (accessed 13 October 2003)..

possibly for economic and technical reasons. In August 2003 a spokesperson for the European Community Bank said, "Being that the euro banknotes are not even two years old, it is definitely too early for this issue to become relevant for the decision-making bodies."<sup>34</sup> While state of the art RFIDs are very small—60 microns is only about .6 the diameter of a human hair and 0.4 mm is about the width of 4 human hairs—they are still considered too large to withstand the handling to which money would be subjected. In addition, because of their cost they would probably only be considered for relatively large denomination bills. But, those are not the primary choice of counterfeiters.

### 6. High Speed Wireless Internet Access

Not only have collections been separated from fixed places; the places *from which* information seekers access information have also become increasingly ad-hoc and fluid. Two of the fastest growing technologies at present are broadband and wireless communication. Organizations and individuals have freed themselves from the tethers of fixed communication networks. Anyone with a portable computer and a relatively inexpensive wireless interface card can now have Internet access from virtually wherever he or she may be. Many libraries have installed wireless access points—a wireless access point is both what its name implies and the technical name for the physical device that serves as a receiver and communication hub that joins a wireless system to a wired network or computing facility. Wireless access points installed in library buildings permit users to access local and Internet resources from anywhere in the building or its immediate grounds, for example, The University of Alabama Libraries (as do many others) even loan portable computers to library users permitting them to access on-line resources from wherever they choose to work in the library.

Starbucks (a US chain of coffee shops) offers high speed, wireless Internet service at many of its shops. Charges are \$6/hour.<sup>35</sup> There are very few costs associated with providing such a service. Thus, Starbucks is charging customers to use the air! Consequently, there is a growing international movement of people providing *free*, high speed wireless access. For example, in New York City *nycwireless* is a group of people who have set up wireless access

<sup>34</sup> MARK ROBERTI, The Money Trail: Reports about embedding RFID tags in money are premature, *RFID journal*, 4 August 2003, <http://216.121.131.129/article/articleprint/523/-1/2/> (accessed 13 October 2003).

<sup>35</sup> T-Mobile HotSpot, Service plans, [http://www.t-mobile.com/hotspot/services\\_plans.htm](http://www.t-mobile.com/hotspot/services_plans.htm) (accessed 12 October 2003).

points that others in the City can use free of charge.<sup>36</sup> The genesis of *nycwireless* was in 2001 when Anthony Townsend, a researcher at New York University, set up an antenna in his office to provide wireless Internet access to people who wish to use it in Washington Square Park.<sup>37</sup>

## 7. Conclusion

Modern communication technologies give librarians the ability to deliver innovative information services of unprecedented quality and scope; and give library users and information seekers the ability to receive personalized, expert assistance to satisfy their information seeking needs. The potential is enormous. Thus, it will be incumbent on library users and librarians alike to ensure that the great information commons that digital technologies have created remain free and open to all.

A variety of text-based communication technologies allow users to gain access as easily to materials in local collections as to materials in repositories on the other side of the planet. Advances in text-based communication technologies make it eminently practical for a remote user to consult with a reference librarian at virtually any time of his or her choosing, and to carry on an interactive dialog. A natural byproduct of the use of the use of any computerized information system is a record of the information that passed through it. Such systems can capture and retain a detailed record of what users sought accessed and what they consulted.

Thus, we must be exceedingly sensitive to the potential for invading users' privacy. As a result of a malignant turn of political events in the US it is no longer sufficient there to think in terms of how a library might use information about its users and how they use its real and virtual collections. We in the US are now forced to project how some overly zealous government agency might use that information or combine it with other information and draw conclusions. Consequently, we can no longer collect information because it might potentially be of use. They must discipline themselves to analyze our own information needs much more

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<sup>36</sup> nycwireless, <http://www.nycwireless.net/>

<sup>37</sup> PETER MEYERS, High speed, freed: Motley crew beams no-cost broadband to New York, *Village voice*, 15-21 August 2001, <http://www.villagevoice.com/issues/0133/meyers.php> (accessed 12 October 2003).

closely than we had to in the past and in the interests of our users tend to err on the side of collecting less rather than more information.

Still in spite of these—albeit serious—drawbacks, the information technologies that we see emerging around us at a prodigious rate promise us access to an unprecedented richness of information sources—but even more interesting they may have also brought into prominence the role and importance of librarians—whether it’s providing 24/7 reference service with the aid of instant messaging, assisting users to with idiosyncrasies of a computerized system or protecting the user’s right to know by resisting encroachment on equitable access to information and the means to access and deliver that information.

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