



# Impacts of IT on Human Behavior in Library Settings

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## ABSTRACT

*Information technologies find a natural application in library settings as a vehicle to manage and distribute enormous amounts of information. Innovative applications of information technology have improved the availability and delivery of library information far beyond what could have been imagined even one generation ago. Because of the foundational importance of libraries to global literacy and scholarship, it is imperative to understand the impact of technology upon the behavior of libraries' human stakeholders. Given that this relationship exists, it is essential to manage technology to achieve the desired range of behavioral outcomes. To this end, we analyze the literature related to recent information technology innovations in the library industry and briefly present the results of a case study of the IT-related organizational issues encountered by one American public library.*

## INTRODUCTION

Innovative applications of information technology (IT) have given the library community new tools to deliver information to patrons. Research indicates a link between human behavior and the choice of information technology solutions for libraries (Olson, 2003). Furthermore, human behaviors affect not only the choice of IT solutions, but also the effectiveness of the IT installations (Clarke & Morris, 1998). Given that human behavior affects the choice and effectiveness of information technology, the next logical question may be: how does the availability of information technology affect human behavior? If the availability of IT affects human behavior, then it is important to identify the resulting behaviors and evaluate the resulting implications.

Given that IT applications continue to evolve, this paper focuses on the social and behavioral implications of the availability of information accessed electronically in library settings. This analysis is presented in a strategic, management, organization, and social issues framework (adapted from Laudon & Laudon, 2003).

## STRATEGIC PURPOSE OF LIBRARIES

The strategic purpose of libraries has been to distribute information to citizens. Those who first campaigned for public libraries in the United States had as their mantra "free libraries, freely available to all" (Gorman, 2000, p. 10). Not long ago, reading material was often delivered by bookmobile. The Internet represents a new delivery system for library information that allows libraries to use innovative information technologies to extend the boundaries of the library beyond physical walls.

The Internet allows online access to databases in various formats and is an important tool for researchers, students and the homebound. In fact, some researchers state that libraries must have an active Internet presence in order to remain relevant (Raitt, 1997). Raitt further recommends that libraries need to make their "collections and stock available on the World Wide Web, and learn to contend with documents in new media" (Raitt, 1997, p. 7). Clearly, the types of information available will continue to expand as technology evolves.

The availability of Internet access to libraries has accentuated the presence of a "digital divide." Access to the Internet requires money,

expertise and location that may not be available to all, especially the "the poor, disabled, rural, young, very old and residents of inner cities" (Gorman, 2000, p. 10). This digital divide may also exist between universities or even within universities by virtue of access privileges (Steele, 1997). Any disruption in the distribution of information creates an imbalance in the access of information that creates inequalities between groups of citizens, universities or even countries. To bridge this gap, many libraries have installed a bank of computers so that patrons may have Internet access.

## MANAGEMENT ISSUES

In order to effectively utilize innovative IT applications, the librarian must decide what information to present (content) and then determine how to present that information (via information technology solutions). The decision to make information available in a given format is constrained by many human factors including, but not limited to, perceived need, public opinion, existing budget constraints and the present political environment.

Once electronic database resources are selected, licensing requirements must be negotiated. Given the number of database/software licenses on any given site, costs can be significant and must be entered into with care. Librarians should carefully review four licensing clauses: "introduction clause, service clause, authorized users clause and licensee clause" (Miller, 2003, p. 20). The introduction clause states the date the license is valid and should begin when actual use begins, not when software is accepted. This ensures that the library pays only when service begins. The service clause should include references to any issues about which the librarian may find important enough to require communications with the provider. The authorized user clause requires that librarians purchase the appropriate number of licenses for use. The licensee clause is an opportunity for the library to limit its responsibility for unexpected bills, changes in subscription fees and any unauthorized use.

Clearly, the selection of what information to deliver (content) and how to deliver the information (chosen technology vehicle) is impacted by human behavior as well (Olson, 2003). The actual implementation of these decisions is also affected by human behavior as revealed in a study by Clarke and Morris (1998). Various staff issues observed were the need to express opinions concerning the way automation would affect individual jobs, the timeline of adoption, the increase in technological complexity and skills already invested in existing systems. The authors recommend that successful system migrations should address employee needs to understand the following: why change is required, how individual jobs change, and how the automation will affect other procedures. It is predicted that improved communication and follow up will result in a more efficient technology migration.

## ORGANIZATIONAL ISSUES

Web-enabled access to databases has changed the organizational behavior of libraries. Prior to the introduction of information technology, many libraries had a rigid hierarchical management structure (Lancaster & Sandore, 1997). Like many other industries, the advent

of information technology caused the power to make decisions and obtain information to be disseminated throughout the organization. Given that power is no longer concentrated at the top of a hierarchical structure, a more decentralized form of organization has become appropriate. A matrix organization of departments, either temporary or permanent, is considered highly effective. As a result, librarian jobs expand and adjust, requiring them to adapt to more open styles of communication, more participative forms of management, and more prominent roles in society (Lancaster & Sandore, 1997).

Prior to the advent of research databases, reference librarians helped patrons look for information in books purchased by the library and kept at a reference desk. Clearly, their role has expanded. For example, Bryant (1999, p. 4) quotes the director of Dixie College Library, Utah: "we have seen the explosion of electronic resources that necessitates a lot more personal teaching." While they may not actually help more patrons, librarians spend a lot of time teaching patrons how to use resources and hardware, such as printers. In addition to helping patrons who visit the physical library to obtain Internet-enabled database access, reference librarians must now answer e-mail from patrons that are off site. Almost 50 percent of librarians surveyed help maintain a library Website, and another 25 percent expected to have Web pages to maintain within another year (Bryant, 2000). Although it takes more time for the reference librarian to help patrons with requests, some librarians feel they now do a better job of getting resources to patrons.

While librarians have an increased workload because of the training they must provide to library patrons, the sophistication of library patrons is also increasing. In a sense technology has made "librarians and patrons more equal" in the use and access of information (Lancaster & Sandore, 1997, p. 27). This represents a foundational change in the relationship of librarian and patron and may even change the definition of "what a library is" (Batt, 1997). Not only are patrons able to access library information without the assistance of a library; technology has actually given patrons the ability to obtain and disseminate information in a manner that makes them managers of their own personal libraries (Lancaster & Sandore, 1997).

Our research included a mini-case study of a suburban municipal public library to gain a better understanding of the organizational issues facing a real librarian that result from the growth of IT applications. Using Yin (1994) as a guide, this brief case relied on multiple sources of evidence (i.e., interviews, observations) to compare the academic literature against an actual library setting. Our study reveals some of the organizational impacts of technology in this library in terms of workload, procedures, training and organization structure. For example, we observed the increased workload for the reference desk staff in managing online databases inquiries as well as the additional procedures that require patrons to complete a form and sign agreements concerning what is acceptable for perusal before using Internet-enabled access to databases.

The introduction of IT has not significantly influenced staff training requirements in this case, although librarians take more technology courses in college and arrive at their job with training and experience in using major databases. Research by Lancaster and Sandore (1997, p.17) indicating the need for more on-the-job training to upgrade skills by "developing a culture of continuous learning" might seem to contradict findings in our study where the staff do not normally participate in additional formal IT training. However, the highly effective service delivered by this library despite the rapidly growing surrounding community seems to indicate that continuous informal learning is a natural part of these librarians' daily routine. They simply must continuously maintain their technological capabilities in order to serve their constituents.

The organizational structure in this library seems to have evolved during their recent investments in IT-enabled resource access. For example, the manager of technical services now has the same level position as does a manager of library services. Moreover, unlike the power struggles suggested by the library automation literature (e.g., Crawford & Rice, 1997), this library has not experienced political struggles between the IT department and the main functional areas of

the library, perhaps because the library's director has actively managed for a proper balance of political power. This contrasts with research that suggests that staff members may polarize into groups that embrace technology and into groups that do not (Lancaster & Sandore, 1997). Effective management of the organizational issues of IT implementations has prevented polarization and created a proactive environment for making innovations in automated information access.

The use of Web-enabled databases in libraries presents additional organizational issues for the library and its patrons. One of the many changes in the role of the librarian is that they are no longer just information keepers and inquiry directors, but now they must adopt the role of fundraiser and technology promoter. At the very time librarian workload is increasing due to many factors including online database management, there is an impending shortage of librarians (ALA, 2003). Hence, there is a possibility of a large void of IT-savvy library professionals in the future unless more is done to attract college students to this profession. Not coincidentally, the American Library Association (ALA) announced that the U.S. federal government has doubled the 2004 funding for recruitment of librarians in order to address this shortage.

## SOCIAL ISSUES

While the increase in the availability of Web-enabled databases is an important technical achievement, the social impacts are just as dramatic. Some of the more obvious impacts of this technological shift are the changing roles and education requirements of librarians. Other important impacts may not be as obvious: information overload, lack of appreciation for the research process, and copyright and plagiarism issues.

One of the less evident impacts upon the library stakeholder is the overabundance of information or "information overload." The consequences of information overload can be observed by the way different generations approach information. Previously, when information was difficult to obtain, research was precious and approached with great seriousness. When a significant amount of information was obtained, the subject could be studied with some confidence that the study was somewhat complete or comprehensive. Today so much information is available that researchers must analyze some amount of material and form an opinion. The sheer volume of material makes it difficult to be confident that a subject has been studied in a somewhat complete or comprehensive manner. The sheer quantity of information available is beyond processing and for some, beyond coping. As a result, terms for this phenomenon have become part of the common lexicon, such as: "information anxiety," "information shock," "information dilemma," "information gap," and "information overload" (Gorman, 2000, p. 7). Paradoxically, the convenient access to information itself has caused users to feel overwhelmed, not satisfied.

Another dramatic social impact of Web-enabled databases is the lack of appreciation for the research process resulting in attendant copyright and plagiarism violations. The research process, before the advent of Web enabled databases, required painstaking examination of paper-based documents. Since documents were expensive to produce, most information had a review process to see if it was worthy of the expense of printing. Therefore, information in print had certain credibility. Thus, information was hard to come by and considered valuable. Clearly, using another person's research without permission was considered a very deliberate act of theft. Contrast this process to the dynamics of researching via a Web-enabled database. The researcher merely needs to type in key words, select articles that match the research interest and print it out for a few cents a page. Even easier, a researcher can just cut and paste the information electronically into their notes. The perceived cost to obtain information is low to many researchers, and perhaps because of this, the misuse of research is on the rise (Willems, 2003, p. 29).

The main interviewee in our case study points out that, through lack of education and experience, younger users of information do not realize the scholarship required to author good articles. The result is that students lack critical thinking toward the materials they are viewing, and may give credence to inaccurate information. Further, material is

sometimes used without proper credit given to the researchers because younger students simply do not understand that, when they cut and paste information from the Web, they are stealing. Our interviewee believes that the role of the library is to make information available as a point of access, and suggests that schools could do more to teach students to double check their Internet sources with approved written sources. Others suggest that librarians should respond more directly and offer solutions to faculty in regards to plagiarism issues. Willems points out that librarians must exhibit exemplary behavior such as following licensing standards to the absolute letter of the contract because the "effort to teach the student [about plagiarism] can be wiped out with an illicit use of software licenses or an unauthorized use of intellectual property" (2003, p. 30). Recent magazine and book publishers who have permitted plagiarism propagate the lack of respect for the proper use of information. Librarians' will need to use their skills to correct the "plagiarism ensconced as students' commonplace approach to research" (Fialkoff & St. Lifer, 2002, p. 2).

It is important to discuss the misuse of electronic library research in an international context. The definition of plagiarism may be influenced by culture and relevant academic experience. There is a dearth of academic research on the subject of plagiarism, perhaps because it is fraught with too many political issues. However, a simple search on the Internet will reveal plentiful references to the subject of definitions of plagiarism for the international student. This is not intended to insult the international student, but it is illustrative of the cultural differences in the definition of plagiarism. One university International Student Handbook states "Canadians who have been abroad have noticed startling differences between Canadian intellectual property usage and other cultures" (University of British Columbia, 2003).

Western academics indicate that some international students have different notions about plagiarism (Fox, 1994). Some educators observe such students exhibit "bafflement about the sin of plagiarism" and are surprised "about Western writers' peculiar notion that individuals can 'own' words and ideas and that this ownership must therefore be acknowledged" (Bean, 2001, p.43). The availability of electronic research has only exacerbated this issue. Countries that have a more collaborative work style may view plagiarism issues differently than Western countries that focus on individual contributions. One university professor has observed that "[i]f the assumption is that people work together to create solutions then their perception of plagiarism would be very different from the definition in countries that stress doing individual work." Accordingly, professors and librarians in the U.S. and other Western nations should discuss the notion of plagiarism with any non-Western students in their classes whenever they assign research papers.

## SUMMARY

While technology is traditionally considered an outcome of human behaviors, information technology is also an influencer of human behaviors. In order to achieve the desired result it is important to understand this relationship, particularly in the context of library information systems. Libraries are foundational to the promotion of global scholarship and should develop into "customer focused, continuous learning, and constantly improving, flexible, quality based" institutions (Steele, 1997, p.149). Our research presents evidence that Web-enabled access does indeed affect the behavior of library stakeholders, particularly that of librarians and their patrons. More research, such as case studies, is needed to identify the managerial, organizational and social implications of how IT influences human behavior after automating library access to resources. Moreover, case studies of the effects of IT in libraries in different countries would generate data for making comparisons of these human factors across different cultures.

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Table 1: Major Lessons Learned from Literature and Case Study

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| IT investments, such as Web-enabled access to resources, precipitate a significant change in the relationship between the librarian and patron.  |
| Librarians have an increased workload due to managing Web sites and databases and corresponding to patrons electronically.   |
| Changes in organizational structure may be necessary to elevate the importance of IT services.   |
| Entry level librarians are required to be increasingly technologically-savvy, and existing librarians need to embrace technological change by continuously learning.                   |
| Librarians should champion IT innovations that provide more seamless access to resources to patrons, including becoming part of technology development projects.                       |
| Libraries need to acknowledge information overload and its effects on patrons and develop techniques to address this phenomenon.   |
| Libraries have an increasing responsibility to educate patrons about understanding and appreciating the knowledge creation process, including respecting intellectual property rights. |

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