3. An Overview of Access and Integrity Issues in the Networked Information Environment

The institutions that are libraries—be they public libraries or research libraries—have addressed a number of concerns about the accessibility and integrity of printed information that arise from diverse quarters ranging from the needs of the academic community to manage and provide access to the scholarly record through the needs of the government to ensure the existence of an informed citizenry with access to vital government information resources. Libraries ensure a certain base level of access to information irrelevant of the financial status of the information seeker. Many of these concerns do not have well-established, clearly defined constituencies or clearly stated requirements. But the concerns are nonetheless real, and of vital importance to our nation and our society. As the nature of the information changes from printed pages to network-accessible information resources, we can no longer assume that old mechanisms will continue to work, or that they will be adequate to address the full range of new issues that are raised by electronic information resources; indeed, we do not yet fully understand the implications of a large scale shift to electronic information or the new roles that we will expect libraries to undertake in this context.

This paper examines a series of specific issues related to the access and integrity of electronic information in a networked environment, and current and potential roles that libraries and other institutions may play in addressing these issues. It also explores the ways in which the transition to the networked information environment may call existing library practices and roles into question.

Access to information in a networked environment is an area that is often treated very superficially. There is a tendency to incorrectly equate access to the network with access to information; part of this is a legacy from the early focus on communications infrastructure rather than network content. Another part is the fact that traditionally the vast bulk of information on the Internet has been publicly accessible if one could simply obtain access to the Internet itself, figure out how to use it, and figure out where to locate the information you wanted. As proprietary information becomes accessible on the Internet on a large scale, this will change drastically. In my view, access to the network will become commonplace over the next decade or so, much as access to the public switched telephone network is relatively ubiquitous today. But in the new "information age" information will not necessarily be readily accessible or affordable; indeed, if information is to become the new coin of the realm, there is no doubt in my mind that there will still be the rich and the impoverished-though even the impoverished may have a relatively high standard of access to information, compared to today's information poor in the US, or tomorrow's information poor globally .11 This

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11 The information poor are not the same as the illiterate. The illiterate are a group that lack specific training and skills increasingly essential in modern society; the information poor may not necessarily lack the skills to find or comprehend the information they need, but rather may simply not be able to afford to pay for access to information. While illiteracy is a problem that is often the result *of* poverty, it is really the lack of a specific skill. Lack of access to information is a condition that is created by at least in part by poverty (and really more generally by a gap between the price of information access and the economic conditions of the person who needs to obtain access to information), but which is at least to some extent rectified by subsidizing information access, as opposed to illiteracy, which usually is not the result of inability of the illiterate to obtain access to printed material. Information poverty is a mix of two factors:

paper will focus on information access issues and largely omit issues related to base network access. Access here will also be viewed in the broad sense; not only considering who can have access and how much they must pay, but when they can have access, and who knows what they are accessing.

Integrity of electronic information is another problematic area. Many people have a bias that leads them to view electronic information as less stable than printed information-electronic information is subject to unannounced revision by insidious parties, corruption by viruses unleashed on the network or by individuals breaking into computer systems. In fact, the issues here are extremely complex, ranging from the balancing of the ability of the network to support access to the most current information against the need to maintain a trail of citeable versions linked to specific points in time, through questions of long term preservation of digital information. It is interesting to note in this connection that many of our expectations about networked electronic information are derived from our experience with, and expectations about, print information, and that in fact we regularly accept completely different rules for broadcast mass media information than we do for print; similarly, much of the legal framework for electronic information (with the exception of some very specific counterexamples, such as integrated circuit masks) also has its basis in practices related to print materials. (It is also worth noting that most libraries have tended to avoid becoming much involved with providing access to the contents of broadcast mass media). Other issues in this area include the problems of intellectual property, hidden bias of many different types, and loss of information diversity available to the public. Our expectations about the integrity of electronic information are unclear; in fact, these expectations vary depending on the use we wish to make of a given electronic information resource.

Integrity and access are interrelated in complex ways; in the evolving context of networked information, the relationship is far more complex than in the existing print-based environment. In the electronic environment the balance of relationships between the creators of information, the distributors and rights holders (publishers), the stewards (libraries) and the consumers of information seem to be changing radically. Within the print literature framework each of these stakeholders had well-established roles in ensuring integrity and providing access; with the shift in relationships and responsibilities, these roles will also change. Access to electronic information is of questionable value if the integrity of that information is seriously compromised; indeed, access to inaccurate information, or even deliberate misinformation, may be worse than no access at all, particularly for the naive user who is not inclined to question the information that the new electronic infrastructure is offering. Further, certain characteristics of the mechanics of accessing electronic information in the networked environment may lead to new means of comprising the integrity of that information.

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inability to afford access to information and lack of skills to obtain, navigate, and evaluate information. One might argue, for example, that many scientists and engineers are in fact information illiterate, although they can certainly afford access to substantial bodies of information; they lack the skills to utilize this body of information. Further, literacy, in an world that is increasingly full of multimedia information, may not be always be a prerequisite to being able to understand information once one obtains access to it. Indeed, in the future, the relationships between literacy, having the skills necessary to locate needed information and/or access to trained intermediaries such as librarians who can help to locate information, and having the ability to afford access to information (either by paying for it directly or thorough organizations like libraries that have historically subsidized access to information) are going to become much more complex, and deserve new attention in the context of the coming age of electronic information.

Conversely, even if the integrity of the scholarly or cultural record is guaranteed, such a guarantee is of limited value without a corresponding guarantee of continued access to such a record.

In discussing issues of access and integrity in networked information today, there is a very strong bias towards issues specific to scholarly information; this is to be expected, given that the academic and research communities have up until now been the primary constituencies on the Internet. These are relatively sophisticated communities, and communities with an ethos that is strongly oriented towards citation, attribution, and preservation of the scholarly record. Indeed, as one reviewer noted, this ethos ties these communities to the system of print publication, and emphasizes that networked information must offer the same integrity and access if it is to become an acceptable replacement for print. Scholars must be certain that their work IS accessible to their peers and that the integrity of their works is maintained. Yet if one examines the current growth of the Internet, the fastest growing sector is commercial organizations. Primary and secondary education and public libraries are one of the major potential growth sectors (if funding strategies can be found to pay for their connection and for the associated information technology and staff training investments that will have to be made within the institutions themselves). There is now discussion about the role of the Internet as a precursor to a National Information Infrastructure (which really might be more appropriately called a National Networking Infrastructure) which would connect an even broader constituency. As the networked community expands, we will see a continued shift in expectations and values about information access, integrity and management, and the appearance of new types of information that have much more in common with the traditional contents of print and electronic mass media today than the bulk of the information that populates the current Internet. This paper thus attempts to take a broader view of the access and integrity issues, and to view them in terms of the expanding constituencies and types of information on the network.

To help to further clarify the scope and focus of this paper, let me emphasize that the paper devotes very little attention to the important and currently vigorously debated questions about government information, and in particular what government information should be available to the public, under what terms, and at what costs. This is a public policy issue of considerable complexity in its own right, and has a number of specific implications for libraries, particularly in their roles as depositories of and access points to government information. If anything, the emphasis here is more on information created and owned by other institutions, such as publishers and the academic community. An aggressive government program which expands the base of publicly owned information that is then made available to the public widely, at little or no additional cost, could well begin to alter some of the trends and evolving balances that are discussed throughout this paper. These issues merit considerably more exploration and discussion. Hopefully, however, this paper will provide a basis for such discussion, since, to a great extent, issues of access and integrity of collections of information in digital formats, and the roles of libraries in organizing, preserving and providing access to these collections of information are independent of the information's source.