

# Humanists Revisited: A Longitudinal Look at the Adoption of Information Technology

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*Developments in information technology have had a major impact on the conduct of research and scholarship. In general, humanists have been slower than scientists and social scientists to adopt new technologies in their work. This paper, a longitudinal study of eleven humanists, corroborates the general pattern and provides insight into why humanists use technology as they do. It relates its findings to a definition of the humanities: those fields of scholarship that strive to reconstruct, describe, and interpret the activities and accomplishments of men and women by establishing and studying documents and artifacts created by those men and women. The discussion emphasizes that the primary evidence that humanists use differentiates them from scientists and social scientists.*



It has become a platitude that information technology is transforming the way scholars work. Discussions of this transformation usually stress both the speed and the scope of change. Certainly in less than a decade almost all scholars have adopted the basic technology of word processing. And scientists and social scientists use technology to store, send, retrieve, and analyze their primary data or evidence. At the same time, the technological resources available to humanists have grown tremendously.<sup>1</sup> But the behavior of eleven humanists studied over a five-year period suggests that scholars in the humanities are adopting new technologies relatively slowly.

We first interviewed and observed the eleven in 1987-88 when all of us were fellows in our campus Institute for the

Humanities. In initial interviews we asked the fellows how they did their work. We not only focused on their fellowship year projects and raised questions about the use of information and libraries, but also encouraged the scholars to discuss topics outside our focus. In addition, we participated in a series of group discussions on methodology and raised questions about scholarly practices in forums that followed the public lectures fellows gave about their fellowship year projects. Whether with individuals or in groups, we spent at least fifty hours with each fellow. In the 1992-93 academic year, we revisited each fellow with an interview of one to two hours. The interviews followed a written list of questions. These questions asked about changes during the past five years in important aspects of

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their scholarship with special emphasis on the use of information technology.

In this report, we first discuss how representative the fellows are of other humanists. We then describe their use of information technology in five areas: word processing, use of online public access catalogs (OPACs), bibliographic database searching, electronic mail, and other applications. Finally, we offer a definition of the humanities that serves as a basis for explaining the relatively slow adoption of new technologies by humanists.

### REPRESENTATIVENESS OF THE HUMANISTS STUDIED

Any study based on eleven persons must ask how representative is that group. Certainly eleven individuals cannot encompass all the varieties of scholarship within the humanities in the proportions in which they are found in the larger population. And since the entire group comes from the same academic institution—a research university in a major metropolitan area in the United States, to name just the principal distinctive characteristics of their environment—their representativeness is further limited. Yet among them, the fellows cover many important aspects of humanistic scholarship.

One way to view the diversity among the fellows is by their departments: anthropology (two), English (three), history (two), history of art (one), philosophy (one), political science (one), and women's studies (one). Some historians see themselves as social scientists, but neither of the historians in the seminar does; nor does the women's studies professor who is conducting historical research. The three seminar members who come from fields usually classified in the social sciences—anthropology and political science—are conducting research that exemplifies the current trend for social scientists to return to the humanistic roots of their disciplines. One of the historians said he did "plain old history"; the other described himself as traditional, not using trendy or novel methods. Two other fellows pursue conventional topics and methods largely

within their home disciplines. At the same time, seven fellows do interdisciplinary work: one fellow from English incorporates social science information in her study of film; a literary critic draws on psychoanalysis and philosophy; a historian of art considers his work to be part of American Studies; and the anthropologists, political scientist, and women's studies scholar bring the insights and methods of their disciplines to humanistic sources.

There are two important ways in which the fellows distinguish themselves among humanities scholars. First, they are older than many; the median number of years since obtaining the doctorate was twenty-two, the average twenty, with a range of ten to twenty-nine years. Harriet Lonqvist and Idrisa Pandit, among others, have found that less experienced humanists behave somewhat differently from seasoned scholars.<sup>2</sup> The fellows fall in the latter category. Second, the fellows are unusually successful in research. Among them are winners of national fellowships and grants as well as authors of prize-winning books. They have sustained through their careers rates of publication well above average.

Despite these distinctive characteristics, the findings about the fellows' use of information technology are probably typical of many other humanists, especially those who are mature and do research. An earlier study of the fellows' information seeking behavior showed that they were consistent with prior findings about humanists: (a) most were the sole authors of their publications; (b) they relied heavily or partially on library collections for their research; (c) they rarely consulted general reference librarians; (d) their use of formal bibliography (as opposed to bibliography in the scholarly literature) was limited.<sup>3</sup> In addition, as we shall see below, their current use of information technology fits what several other studies of humanists have found. In short, the present report offers insight into the use of information technology for research by mature, successful humanists through 1992.

TABLE 1  
INFORMATION TECHNOLOGY USED BY HUMANISTS INTERVIEWED

Year of Ph.D./Rank	Word Processing	OPAC Use	Database Search	Electronic Mail	Other Applications	Computers Used*
1963/ Professor	Yes	In-library remote	None	Yes	None	Mainframe Home
1965/ Professor	No	In-library	Mediated '87-'89; '89+	None	None	None
1968/ Professor	Yes	In-library	Mediated '87-'89	None	None	Home
1969/ Professor	No	In-library	None	None	None	None
1970/ Professor	<b>Yes/Notetaking</b>	In-library remote	<b>1 as end user</b>	<b>Yes</b>	<b>Statistical analysis</b>	Home and office
1970/ Professor	<b>Yes/Notetaking</b>	In-library	Mediated '87-'89; '89+	None	<b>Relational database</b>	<b>Notebook, home and office</b>
1975/ Professor	<b>Yes/Notetaking</b>	In-library remote	Mediated '87-'89	Yes	Bibliographic database	Home and office
1975/ Associate Professor	<b>Yes/Notetaking</b>	In-library	Mediated '87-'89; '89+	None	None	Home and office
1976/ Professor	Yes	In-library	None	None	None	Laptop and office
1978/ Associate Professor	Yes	In-library	None	None	<b>OCLC</b>	Home
1982/ Associate Professor	Yes	In-library	Mediated '87-'89	<b>3 times</b>	<b>Spreadsheet</b>	Home

Note: **Bold** denotes first use after 1988.

\*Home and office designates desktop computers at those locations.

## FINDINGS FROM THE INTERVIEWS

### Technologies Used

Our recent interviews revealed that all of the fellows continue to have as their principal goal writing a book. True, they disseminate the results of their work in other ways as do other humanists.<sup>4</sup> But their emphasis on their books fits with bibliometric studies that show the centrality of the monograph in the humanities.<sup>5</sup> John Cullars' research has found that the typical humanities monograph has between 250 and 300 pages.<sup>6</sup> Given the length of their books, humanists have great need for mechanisms that enable them to write and revise with ease. The technological innovation that makes this possible is word-processing. Word processing is a regular and essen-

tial part of all but two fellows' lives. Most fellows had adopted it readily, usually at their own expense, on the recommendation of family, friends, or colleagues. Seven of the eleven used word processing in 1987; nine of eleven in 1992 (see table 1).

We gain a sense of how much word processing has captured humanists from the comments of one fellow who adopted it reluctantly. At our first interview, he reported his continued use of a manual typewriter and referred to the computer revolution as a capitalist plot. Revisited, he reported he had been writing with a computer for over four years.

Besides word processing, the only widely shared use of computers by the fellows was searching library online public access catalogs (OPACs). Two aspects



of OPAC use deserve mention. First, as residents of a metropolitan area with many academic libraries, some fellows use more than one OPAC. Second, like most OPACs, their campus catalog has changed features from time to time. Most of the eleven took those changes in stride, but four volunteered that they had experienced trouble as a result. Having trouble does not necessarily equate with inability to use. One fellow who reported frustration also said that since 1987 she had downloaded OPAC records to create bibliographies.

The Getty Online Searching Project reports its participants clearly understood that an OPAC was better for finding known citations than were online databases.<sup>7</sup> Similarly, the fellows told us they largely used OPACs to find known items. While the fellows did not have the extraordinary opportunity to search online databases afforded scholars in the Getty project, a librarian had been assigned to them from 1987 through 1989 to do without charge any kind of searching they wanted. She kept a log of what she did and reported spending slightly more time on subject searches than seeking known items.<sup>8</sup> Only three of the eleven reported having had searches done for them since 1989, and one had done a search for herself on a locally loaded database provided at no fee by her campus library. She stressed she did this for her teaching, not her research. In response to a follow-up question, she said she strongly doubted she would ever do a database search for her research.

Electronic mail has had a major impact on the lives of many academics and overall at the fellows' home campus use of electronic mail is widespread.<sup>9</sup> Yet only two of the fellows had used e-mail in 1987-88 and only two more used it in the following five years. One of the latter had sent "only about three messages." Use of electronic mail among the fellows, while limited, is in line with use by other groups of humanists. Survey responses in 1990-91 from over 6,700 members of the Modern Language Association revealed roughly one-fifth used e-mail.<sup>10</sup> In interviews during the same

time with twenty-one humanists, Idrisa Pandit found two users.<sup>11</sup>

Besides word processing, searching OPACs, and electronic mail, what other uses have the fellows tried with their computers? One person has developed a large database that describes the art works he is studying. A second kept separate bibliographies for her two major research interests using a bibliographic software package. A third did statistical analyses of demographic data she had gathered. These three and one other fellow take notes on their computers using their word-processing software. A fifth fellow searches OCLC to locate copies of titles that he later obtains through visit or interlibrary loan. A sixth fellow uses a spreadsheet to keep track of family finances.

#### *Expansion of Use of Technology*

The range of use of computers by some of the fellows suggests, just as the Getty Online Searching Project did, that humanists have potential for using information technology. But despite their potential, the group has been slow to expand its use of information technology. Only six have gone beyond word processing and OPACs, and each of these is limited to one or two regularly used new applications. Their slowness might be attributed to lack of funds. And certainly the fellows are not as well funded as scientists and social scientists of comparable achievement. But while limited funding may be a factor, it made no difference in the adoption of word processing for almost all of the fellows. Noteworthy in this regard is one fellow who had been granted several thousand dollars as a university scholar to support his work in any way he chose. He was still using a computer whose normal storage capacity he described as thirty-five pages. He wanted to buy a new machine and planned to do so, but he had been a university scholar for two years at the time of our second interview and still had not purchased it. Money was not a factor in his case.

While lack of money may be only a minor factor in slow adoption of infor-

mation technology, frustrating experiences with computers and hearing reports of such experiences may play a greater role. A common feature of our interviews was what we call "computer horror stories." These are tales of long hours of frustration or failure or both. One fellow reported spending so much time inputting and trying to print a database of bibliographic references that she concluded she could have typewritten it as quickly. She compiled a second bibliography with the same software, but repeatedly failed to print out the second in the same format as the first. Another fellow characterized the amount of time she had spent learning to use a computer as "ridiculous." A third fellow described how he had composed a letter of recommendation on his computer at home, brought a disk to campus to print on a printer better than his at home, failed because of software incompatibility, and ended having the departmental secretary rekey and print it. A fourth fellow was repeatedly frustrated in early attempts to print out her writing. She continued to do word processing, but delegated all other computer work to assistants. A fifth fellow did her first book on the mainframe. She found the mainframe consultants very friendly as they helped her learn the system. But because it worked so poorly, the experience made her hesitant to spend time learning new applications.<sup>12</sup>

Of course, all users of computers or any other technology have similar stories to tell. The question is why these might inhibit adoption in the humanities more than in other fields. And the differences in use of technology are clear, once the nearly universal word processing and searching OPACs are set aside. Humanists use information technology less than scientists and social scientists for communication (e-mail), bibliographic searching, and storage, transmittal, and analysis of primary evidence. In most fields in the sciences and social sciences, at least a majority and in some fields virtually all use electronic mail, not the roughly 10 percent to 30 percent found by the large-scale MLA survey, Pandit,

or this study.<sup>13</sup> Comparative data on online bibliographic database searching by scholars are limited, but what exists suggests far greater use by scientists and social scientists than humanists.<sup>14</sup> As for data storage, transmittal, and analysis, most laboratory equipment in the sciences has computer components and many scientific fields, such as oceanography, rely heavily on data shared over networks.<sup>15</sup> Indicative of the difference between the social sciences and the humanities in use of information technology for data storage, transmittal, and analysis is a comparison of the founding dates of the Interuniversity Consortium for Political and Social Research—1962—and the Center for Electronic Texts in the Humanities—1991.

#### DISTINCTIVENESS OF THE HUMANITIES

In reflecting on the differences among the sciences, social sciences, and humanities, we have been trying to identify the characteristics of the humanities that differentiate them from the sciences and the social sciences and that might explain at a basic level the distinctiveness of humanists' behavior. This reflection has brought us to the following definition of the humanities: those fields of scholarship that strive to reconstruct, describe, and interpret the activities and accomplishments of men and women by establishing and studying documents and artifacts created by those men and women. Crucial to this definition and to the distinctiveness of the humanities is the primary evidence or sources humanists use: documents and artifacts created by persons whose activities and accomplishments the humanist seeks to reconstruct, describe, and interpret.

To better understand this definition, it is useful to look at all scholarship as a continuum from the physical sciences to the quantitative social sciences to the qualitative social sciences to the humanities. Moving along this continuum from the physical sciences to the humanities, one can say roughly that the scholar exercises decreasing control over the primary evidence that is analyzed. We

suggest the proposition that the less control over primary evidence the scholar has, the harder it is to utilize information technology. The rest of this article attempts to develop this proposition by discussing the humanities and contrasting them at places to the social sciences, especially survey research.

### *The Humanities and the Social Sciences*

Like the humanities, the social sciences also attempt to describe and explain the activities and accomplishments of men and women. The overlap between the practice of the humanities and the social sciences is great enough that it can be difficult to separate the two. Yet there is a difference. Comparison of the work of humanists with that of social scientists shows that fundamentally humanists use sources created by the subjects of their research, while social scientists initiate and, much more than humanists, participate in the creation of their sources.<sup>16</sup> This is a fundamental difference, not because there are no exceptions to it (there are many), but because it points to what predominates in each area of scholarship.

Emphasizing that humanists use documents and artifacts created by persons whose activities and accomplishments the humanist studies is not to say that humanists never have a hand in shaping the evidence they use. When humanists edit primary sources, their judgment and imagination may determine the content of parts of the source. But in the humanities the primary source is there first, and ultimately, humanists measure their success and condemn each other's failures in editing by how well the edited version measures up to the original and its variants. At the same time, we cannot say that social scientists invent their evidence as a novelist writes fiction. When social scientists conduct a survey, the responses of those surveyed are the evidence. But in the social sciences, no source exists until social scientists begin work. Through their survey instruments, social scientists limit the range or specify the particulars of their subjects' responses.

Because the subjects of humanistic research create the primary evidence of the humanities, these sources are the products of a specific place and time and shaped by the distinctive personalities of their creators. Since these sources are not products of social scientific method, they are multifarious, often incongruous and diffuse, and harder to coordinate and manipulate than survey research data. For example, in discussing historical evidence about location, age, and value of currency—phenomena that can be described quantitatively—Manfred Thaler shows how primary sources can confound efforts to pin down specifics by latitude and longitude, date, and a standard exchange rate. Regarding exchange rates he writes:

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When comparing the temporal and spatial frames derived from the source with the entries in the currency database, check whether these frames are close to a point where different ones would apply (i.e. whether the exchange rate changed shortly before or after our information was fixed in writing, or the place where it was recorded lies very close to a border between two territories with different coinage). . . . It should be emphasized again and again that considerations like these are just the beginning.<sup>17</sup> Given that phenomena described quantitatively can be this hard to handle, one recognizes there will be even greater difficulty treating literary, artistic, or other sources that have primarily qualitative and aesthetic dimensions.

### *Primary Evidence, Secondary Literature, and Technology*

The nature of the humanist's evidence affects how a humanist analyzes it and writes it up. Current information technology is less useful for analysis of the



humanist's primary evidence than for the social scientist's primary evidence. Humanistic evidence is not easily categorized and entered into a relational database and not readily subjected to quantitative measure or statistical analysis. Regarding categorization of evidence, Donald Case's research has revealed that because historians find categorization difficult, they tend to change their categories during the course of a project, particularly during the write-up. Sometimes historians place a single piece of evidence in two or three categories.<sup>18</sup> Case's research helps us understand why historians who have great interest in using computers to analyze primary evidence emphasize the difficulty of creating machine-readable databases from the original sources.<sup>19</sup> True, humanists can subject some evidence, like demographic records, to computer analysis. Also, humanists can take any text file and subject it to quantitative linguistic analysis. But evidence like demographic records that derive from a social science tradition is only a small portion of the surviving documentary record. And quantitative linguistic analysis is just one method and some humanists argue against it, even when a strong case can be made for its use.<sup>20</sup>

It is instructive to contrast the humanist to a social scientist who has quantitative data needing analysis, for example, a thirty-item questionnaire returned by more than three hundred respondents. Even if it takes the social scientist many hours to get the hardware and software running, the results will appear in seconds, and, perhaps most important, far more accurately than with calculations done by hand. In contrast, humanists, whose sources are nineteenth-century English literature or proceedings of 1890s state political conventions or American films, have no generally accepted software package that can analyze such evidence according to the interpretive viewpoints that are evolving in their minds.

Given the humanist's evidence, it is more difficult for humanists to collaborate than social scientists. Because their evidence is not created according to a set

of rules that yield data falling into crisply differentiated categories that welcome quantitative analysis, their work cannot easily be divided into discrete tasks that different members of a research team can perform separately and later assemble. Likewise, the uniqueness and scatter of humanistic data invite individual, not collaborative, interpretation. Consequently, humanists normally take sole responsibility for their projects. True, as Pandit has shown, they consult other scholars.<sup>21</sup> But consultation for humanists is more limited than for social scientists who share responsibility for projects. Since humanists write alone, we would expect that they would begin to communicate electronically later than social scientists and that their use would be more limited. Interestingly, in a conversation in fall 1993, the fellow who had earlier reported about three uses of electronic mail, stated he had been using it much more since that earlier report. He added that in general he did not like it, but that he had found it very beneficial for exchanging drafts and comments with the second author of the first coauthored publication of his career.

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Finally, given that the primary evidence humanists use is the product of a specific place and time, shaped by the distinctive personality of its creator and not easily categorized, ordered, and manipulated, we would expect that humanists must write at greater length than social scientists to describe and explain their topics. First, since little of what they find is quantitative, they cannot summarize results in a few tables. Second, and more important, the unique features of the evidence must be made known and differentiated from analogous evidence. Helen Tibbo's research on abstracting for the humanities shows

how historians want abstracts above all to contain specific dates, time span indicators, and names of geopolitical units, individuals, and groups that are found in the work being abstracted. Such elements are unknown in scientific and social scientific abstracts she studied.<sup>22</sup> Description and explanation of such phenomena fill the pages of humanities monographs.

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Thus, the standard report of research in the humanities is a 250- to 300-page monograph. Clara Chu found literary scholars reported taking between four and nine years to complete a book.<sup>23</sup> The fellows fall within that range. This allows the humanists few significant breaks in their workflow. Lacking these breaks, humanists are reluctant to take time from their projects to buy, install, and learn to use new hardware or software. One fellow, who in 1992 was finishing the book he had started in 1985, told us that he had purchased his first computer after he completed a book and before he began working on his present project. He now used his computer for all his writing. He stated that once he completed his current book, he would buy a new machine and explore adopting new uses such as taking notes.

Here, it is worth pointing out the tremendous reading load the monographic literature places on humanists. Several fellows remarked about not having time to read the journals to which they subscribed. The librarian who did searching for the fellows suspected they sometimes did not want her to supply them with more references because they already had enough to read.<sup>24</sup> Humanists' limited use of comprehensive bibliographic sources like *Historical Abstracts* and the *MLA Bibliography* is well

documented in the literature.<sup>25</sup> Even investigators in the Getty project concluded that the humanists they studied "took less advantage of the opportunity [to search DIALOG] than might have been expected."<sup>26</sup> Perhaps one reason for humanists' limited use of bibliographic databases is the numerous bibliographic references they encounter in the monographs they read. Unlike those found in bibliographic databases, these references appear in the context of scholarly writing which helps the humanist assess their relevance.

In summary, given the difficulty of analyzing their evidence with readily available software, the rarity of coauthorship, and the abundance of references to the secondary literature in the monographs they read, it is understandable that humanists have not employed information technology to the extent that other scholars have. We have suggested that this difference can ultimately be attributed to the primary evidence that humanists use.

## CONCLUSION

In the future more and more of the documents and artifacts that people create will be products of information technology. Also, many sources from the precomputer era are being converted into machine-readable form. Given that humanists establish and study documents and artifacts, the growth in those that are technologically based argues strongly that humanists will have greater involvement with information technology. Furthermore, as the percentage of humanists communicating electronically grows, those who do not use e-mail will have increasing reason to do so or lose contact with their peers. But it is not certain how much technology humanists will demand. Developments in scholarly methods and individual preferences will play major roles in the outcome. Historically, particular scholarly methods and approaches wax and wane. Examples are numerous. The philological approach to literature—one seemingly suited to computerization—gave way to criticism. Today's critics show little in-



terest in computers.<sup>27</sup> Around 1970 historical demography was a central concern in early American history; today it is on the margins of the field.<sup>28</sup> Phyllis Franklin has noted that at the same time that literary scholars' use of electronic communication is increasing, their preoccupation with print is intensifying. For large numbers of scholars, digitized copies cannot replace originals.<sup>29</sup>

On an individual level, the experience of the fellows suggests that mature humanists will expand their use of technology slowly. While scholars with ten to thirty years' experience will eventually give way to younger persons, they will still be a substantial proportion of humanists for the next twenty-five years. Responsive library service will not ignore their preferences. Furthermore, table 1 shows that the heaviest users of technology were not the youngest fellows, but two who received their Ph.D.'s in 1970 and fall in the middle of the age distribution. Interestingly, one of these two did not use word processing in 1987. Also, a fellow who received her Ph.D. in

1975 had assistants search bibliographic databases and run statistical software for her, but restricted herself to word processing. These case histories suggest there is no guarantee that youth and increased use of technology walk in lockstep. In all, the fellows' behavior reminds us some humanists will use technology much more heavily than others. Findings of the Getty online searching project corroborate this observation.<sup>30</sup>

The field of library and information science has been so stimulated by developments in information technology that it is easy for librarians to lose sight of users who have limited interest or need for technology. In providing service, practitioners need to be sensitive to the preferences of those who eagerly adopt new applications of technology, those who want to use as little technology as possible, and those who fall in between. This is a difficult assignment. Continued research to monitor changes in the disciplines and in patterns of individual behavior is essential for success at this task.

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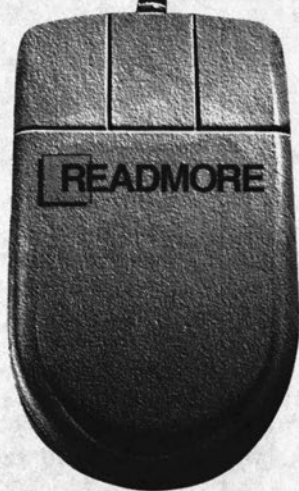
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