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Wearable ARNOVA: The Intersection of Ubiquitous Technology, Knowledge Management and Nonprofit Scholarship

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Author's Note

This paper was written and presented before iphones, ipads, smart watches, GPS and other ubiquitous technology came into widespread use.

Abstract

Technology has created important new possibilities to expand and enrich the scholar's work situation. The Internet, on-line databases, collaborative technologies including Listserv/discussion groups and teleconferencing have made it possible for nonprofit scholars to collaborate in innovative new ways and produce their work at unprecedented rates. Electronic technology is one of the significant forces underpinning the growth on nonprofit scholarship. A number of institutions have made great strides in providing a rich research environment for nonprofit scholars. Efforts to create on-line communities have been fruitful and rewarding. Nonprofit researchers can develop relationships and share ideas with others anywhere in the world. The development of significant on-line nonprofit materials has freed scholars from the necessity to physically visit inaccessible libraries and archives. These developments will experience additional significant improvements with such innovations as XML-based document sharing systems (Lohmann, 2001). Now is the time to take the next steps. Ubiquitous Technology – available everywhere and relatively transparent or invisible – within the knowledge management framework proposed by Lohmann (2001) can create entirely new and ongoing nonprofit research conversations. Wireless technology and various types of smart resources can build on the progress already made and help create a scholarly community within virtual space (Dertouzos, 1997; 2001). This paper examines the role of ubiquitous technology in the ongoing world of nonprofit research and theory building, the current supports for scholarship and proposed new possibilities. The technological, organizational and social impacts of this transition are also examined.

Introduction

One of the largely unheralded changes wrought by the introduction of technology in education is the range of new possibilities it has opened up for modifying the nature of scholarly work. Understanding the nature of these changes for knowledge workers of all types is particularly difficult in a field like nonprofit studies, where there is a combination of the teacher-scholars and those who are primarily oriented to professional practice and pedagogy. These groups vary in their interest in the more esoteric concerns of epistemology and ontology.

Before we lose some readers by throwing around such terms, it is worth noting that each of these terms refers to questions of major importance in nonprofit studies. The term *knowledge worker* here is widely inclusive; referring to classroom teachers, field instructors, researchers, policy analysts, administrators and managers, planners, and thoughtful practitioners of all other kinds, professional and para-professional alike. The importance of the term is as a reference to all who strive to guide their daily activities by knowledge – of themselves; of clients and stakeholders and of the character of the broader world (Huey, 1994; McNutt, 1996). The term is intentionally an overarching one. While there are knowledge workers *in* nonprofit studies, there are also knowledge workers *outside* nonprofit studies. Some of the concerns of knowledge workers in nonprofit studies are restricted to the field exclusively, while a great many other concerns are more general and even universal concerns. Keeping track of which is which and how each relates to technology is, at heart, an epistemological issue.

Epistemology and Knowledge Building

Epistemology is the branch of philosophy (and for our purposes, knowledge work in general) concerned with the nature of knowledge, its foundations, scope, and validity. *Ontology*, a term, which is very much in play in artificial intelligence and knowledge management these days, refers to the branch of philosophy concerned with the nature of being. Finally, *pedagogy* is a term also of Greek origin for the science and practice of teaching. From the standpoint of all three, there are at least three fundamental questions:

- What is (and can be) known of nonprofit practice?
- What is (the nature or character of) nonprofit studies ?
- How can we teach people to do nonprofit studies?

Within our familiar terms, these are among the key questions on the theory side of the familiar “theory and practice of nonprofit studies” formulation. Throughout the twentieth century, nonprofit studies developed and refined its own signature model of theory and practice; one that place great emphasis on social relationships as avenues for knowledge

transmission, on social processes and on the introduction of a Deweyan pedagogy of learning-by-doing. In the early decades, these approaches departed significantly from the ontology, epistemology and pedagogy of the academy, but have more recently become acceptable, and in some cases, even fashionable. The nonprofit studies field placement or internship has been generalized in recent years in nonprofit studies¹ and is now widely touted in many disciplines as “service learning.”

In more recent decades, the introduction of elements from a vast array of competing epistemologies, pedagogies and even ontologies have produced many claims of individual “eclecticism” among knowledge workers in nonprofit studies

While nonprofit studies in the future will almost certainly be impacted, like everything else, by technology, we are especially concerned here about the impact on knowledge management within the discipline. It is becoming increasingly possible to visualize knowledge management in the social sciences as the construction of semantic webs, linkages and connections between meaningful information of all types. Thus, it is possible to visualize a scholarly association like the knowledge workers of nonprofit studies as a network of related associations that also includes ISTR, NCVO, ANZTSR, the Independent Sector Research forum, the AFP research initiative, the Nonprofit Alliance, et. al.² And to visualize the documents we collectively produce as records in a vast and complex virtual database to which members contribute as peers. in various roles as authors, reviewers, critics, and commentators. (Lohmann, 2001)

Knowledge Management, Knowledge Development And the Fate of Nonprofit Scholarship

The practice of knowledge building and knowledge development is usually equated with efforts to increase the amount of research conducted on issues related to the sector. It is generally assumed that more research will lead to better outcomes and a more useful knowledge base for nonprofit professionals and academics. There is no question about the importance of research in this endeavor but the assumptions that are commonly made oversimplify the process of creating a useful body of knowledge.

Research is one part of an on-going discourse that results in the development and dissemination of knowledge. It is useful to think of the

¹ References to nonprofit studies throughout this paper refer to research, teaching and service in the 100+ specialized programs in nonprofit management, philanthropy, third sector studies, management, fund-raising, nonprofit leadership and related subjects which have grown up since the 1980s.

² A few years after this paper was first presented, Hess and Ostrom (2007) coined the term knowledge commons to label precisely this domain.

knowledge building process as a conversation between researchers, theory creators, practitioners and other stakeholders in the process. Technology can facilitate the effectiveness of all aspects of the process through its ability to automate routine tasks and facilitate communication.

Information Technology has already played a role in the knowledge building process. In many ways, technology has made the process more efficient and effective by extending the scholar's traditional tools. We argue that it is now poised to revolutionize the process and create new vistas for how scholarship is conceived and conducted.

The Role of Technology in Knowledge Development

Scholarship has traditionally been thought of as a process conducted by a solo practitioner or small team who review the works of others, consult with them occasionally and independently conduct and present his or her own research. Traditionally, scholars have had contact with a few individuals outside their own institutions but the transaction costs of maintaining a larger scholarly network were too prohibitive for many more. It was only at the point of presenting finished, or semi-finished “products” that extensive collaboration with others was expected. This research product or result is published after being presented for review by other scholars and eventually published. The latest knowledge is disseminated at conferences and typically not seen in print until years later. The process is time consuming, does not benefit from economies of scale or scope and is difficult to improve in terms of productivity. It is also a process that is prone to reinventing the wheel as scholars often duplicate each other’s efforts without necessarily replicating one another’s findings. The scholarly conversation was, at this point, frequently a discussion without much continuity.

It is possible to visualize the impact of electronic technology on research and scholarship as a series of stages (See Figure 1). The initial state of technology-assisted scholarship began in the late fifties and early sixties with the introduction of mainframe computers. These huge entities provided two things that the scholar needed desperately, the automation of statistical analysis and the beginnings of on-line databases. This freed individual scholars and their institutions (who could afford it) from the tedious work of reviewing hundreds of abstracts by hand or conducting statistical analysis by hand or with a calculator and card sorter. This made things much better for everyone and allowed a number of previously impossible large-scale studies to go forward. Eventually, the development of some networking was possible using those same mainframe resources and e-mail systems such as ARPANET (and later BITNET) sprung up to support very limited scholarly communications, at least for the cognoscenti. Changes in the scholarly role were minor although the labor saving was substantial.

The next level was reached with the development and wide scale dissemination of personal computers, including the early TSR-80s., IBM-PCs and Macs. This gave scholars an exciting new set of capabilities. Suddenly, word-processing was available, along with growing statistical analysis capability and directly on the scholar's desktop. The ability to create and search databases at the library (and later on the desktop) also added a great deal to productivity. The development of expensive but widely available communications networks and tools such as BBS communications made more direct contact with other scholar's possible. The development of the text-based Internet and widely available e-mail also began to change the discussion.

Figure 1

Stages in the Evolution of Technology Support for Nonprofit Scholarship

Legacy Stage

Mainframe Computers with primitive communications capacity. Some e-mail but without graphics. BITNET. Technology for statistical analysis and expensive and limited databases. No real change to the centuries old scholarly model.

Intermediate Stage

Early PCs replace the mainframe and the Internet develops. This allows traditional scholarship in many other places and allows scholars to own the means of scholarly production. Simple lists and BBS emerge. Gopher Space. Some changes in scholarly role begin becoming apparent as small groups of faculty converge over BBS. The scholarly role becomes less institution specific.

Early Internet Stage

Later PCs with real processing power emerge. Portable technology also emerges. E-mail becomes very sophisticated and discussion list technology emerges. The web becomes a useful medium for publishing. On-line journals emerge. Databases become more sophisticated. On-line scholarly commons becomes possible. The scholarly role moves more into the virtual realm. Connected scholars reach critical mass and become more productive.

Late Internet Stage

Wireless and mobile technology frees scholars from the constraints of geography. Huge data libraries are available and used. High bandwidth makes possible real time conversations. Virtual universities and think tanks emerge. Scholar BOTS take over the repetitive work of scholars.

Nonprofit scholarship takes on a completely different complexion. Institutions become bedroom communities for their scholars and unconnected scholars fall hopelessly behind.

Scholarship proceeded along the traditional path but there were some cracks in the foundation. Bibliographic databases able to interface directly with Internet resources like the Library of Congress Card Catalog and with word processing software did much to reduce the onerous scholarly labor of notation and citation.

The underlying technology was already pretty well developed in the 1970's, but only came into widespread use in the 1990's, as genuine on-line communities of scholars began to emerge. As one such case, ARNOVA-L is a 12-year old working scholarly community of more than 1,100 researchers, practitioners and students in 42 countries.

The period that we are currently a part of has been revolutionized by the Internet and World Wide Web and ever more powerful personal computers and by the transformation in the scholarly commons that these changes engendered. New indexing and publishing technology, such as XML, and file sharing technology, such as Napster, make knowledge sharing easier. The corporate sector interest in knowledge management (Lohmann, 2001) created a revenue stream for the development of software designed to assist in the knowledge development, cataloging and dissemination process. The intellectual tools that Knowledge Management provides (Lohmann, 2001) are directly applicable to maintaining and extending the scholarly conversation in nonprofit studies.

The traditional process of writing a paper, submitting it for review and having it published is undergoing a number of serious threats. A number of on-line journals have developed in many of the fields related to nonprofit studies (Lohmann, 2000; 2001). These include Critical Social Work and the Electronic Journal of Social Work as well as more general outlets such as First Monday. These are run, to a large extent, like traditional journals. Submission of articles is often on-line and the review process is managed on-line. This is increasingly true of a number of traditional journals, including *Nonprofit Management and Leadership*. The major difference is the reduction of costs and the speed of publication. Traditional journals are fantastically costly and publication delays can take years. The traditional journals have started to move content on-line, either as teaser pieces or as subscriber limited on-line publications. This blurs the difference between traditional and on-line publications.

Another level of blurring which has not yet had much impact on nonprofit studies, but which has had major impact in disciplines like computer science, physics and chemistry, is the widespread practice of making pre-prints (conference papers, drafts for comment, working papers and the like) available online up to the point that they are published. The Independent Sector Spring Research Forum conference on technology in Spring, 2001, NCVO and ISTR are all currently experimenting with on-line pre-prints but there is also still strong opposition to the practice among some circles of nonprofit researchers.

Internet publication is a long-term threat to the ascendancy of the traditional journals, and more importantly, to the revenue streams of the various associations and commercial firms publishing them. One of the standard advantages of these print journals is the complex and expensive

indexing system that has been developed. These various indices have, for the most part, been directly translated into online databases with only minimal accommodation to the capabilities of the technology. Newer developments, like XML and all its assorted spin-offs, as well as JAVA scripts and applets, make this indexing monopoly less unique. In addition, on-line publication creates fewer problems for article length, in addition to the cost and speed issue.

Overall, the scholarly approach to technology in nonprofit studies has been both common-sensical and, in some respects, quite timid. It can be contrasted, for example, with approaches in the humanities that have spawned hundreds of small, unique applications for specific tasks. (See, for example, Condron, Fraser and Sutherland, 2001) While articles (conference papers and journal articles) have always been the coin of the realm in nonprofit studies, this has come at the expense of certain kinds of scholarship and, perhaps, certain points of view. It is completely impossible to adequately represent a 50-page paper in a 15-minute conference presentation, for example, and the economics of journal publishing place similar word and page limits on most published articles. Internet publishing makes all of this available to the scholarly community. But some of the more fundamental developments in hypertext directed at resolving some of these problems, such as the systematic creation of multi-level documents, have made little impact.

In terms of data analysis, developments in high speed computing and sophisticated systems, such as data mining, make it possible to acquire information more quickly and intensively than ever before. Patterns in data that were impossible to identify mere decade ago can be ascertained quickly and efficiently using the tools available today.

The development of more sophisticated collaborative technologies has also moved scholarship toward the future. Discussion lists software as become more advanced, sometime incorporating document -sharing technology, chat and so forth. Yet some scholarly discussion lists flatly prohibit attachments out of genuine fears of viruses, worms and other threats to collaboration. While the problem is real, that particular solution is a positive retardant to scholarly collaboration.

Just as real as viruses are the limits imposed by user naiveté. Several years ago, one subscriber created a major flap on the ARNOVA-L list, for example, by distributing a notice of his thesis acceptance with an attachment of the thesis – all 1.8 MB of it! Several people with slower modem connections reported downloading times of hours as part of their displeasure.

Even more distressing than viruses and naïve users, however, are the legal threats emanating from the commercialization of the Internet. What began as a scholarly commons has quickly become perceived as a threat to a

whole host of established financial interests (including publishers, universities, software companies and, most importantly, music and video corporations). The counter attacks of various hostile court rulings and the Digital Millennium Copyright Act have already seriously re-aligned the traditional boundaries of scholarly fair use. In more extreme forms, these commercial visions of internet-for-a-price literally render the entire vision of a scholarly online commons of shared knowledge illegal. Within ARNOVA, for example, we have gone from a time of freely distributing abstracts of published articles to an adverse legal climate in which it is genuinely unclear whether one can mention, in print, the titles of articles without the authors' or copyright holders' permission!

Copyright law in the United States is grounded in Article 1, Section 8 of the constitution, which reads: "To promote the Progress of Science and the useful Arts, by securing for limited times to Authors and Inventors the exclusive right to their respective Writings and Discoveries." This certainly is a desirable standard, but it mentions nothing of protecting corporate investments or income streams. However, each time the Disney corporation's copyright of the Mickey Mouse character which first appeared in *Steamboat Willey* (apparently a science or useful art?) has approached expiration, Congress has obligingly extended the copyright limit simultaneously broadening the scope of coverage. It is a completely open question of whether the promotion of scientific progress or of useful arts ever enters into these reformulations.

Real-time teleconferencing has become available and affordable. These reduce the transaction costs of maintaining a scholarly network and collaborating with other scholars. High speed broadband access makes such access available at many points.

These changes in technology have been rather revolutionary even as some of the scholarly response has been hesitant and the market response invasive and we have begun to see changes in the scholarly role as people develop collaborative relationships for research and writing and working on efforts that transcend their institutional boundaries. Information is easier to access and to make available. We now turn to the next phase of scholarly technology.

We Aren't in Kansas Anymore, Toto

The major transition that we are encountering now is a move toward Ubiquitous Technology. Ubiquitous technology or pervasive technology as it is also called is technology that is available everywhere and that operates in a transparent, almost invisible fashion. For purposes of this paper, ubiquitous technology, following the definition offered by Mark Weiser nearly a decade ago, refers to arrays of computing devices connected in a wireless

web that permeate our entire physical environment. (Weiser, 1993). Ubiquitous computing is the method of enhancing computer use by making many computers available throughout the physical environment, but making them effectively invisible to the user. (Ubiquitous Computer News, 2002). In this same sense, the engine of your car is invisible; if something goes wrong, you are aware it's there. Otherwise, the car just runs.

UT allows microprocessors in a variety of settings to communicate and collaborate to serve human needs and wants. At a mundane level it means that toasters will be able to talk with refrigerators (the stove is giving me an inferiority complex) but it also means that scholars will have technology that is available everywhere and can allow the scholarly discussion to continue seamlessly.

What will this technology look like? It will be more able to break the barriers of distance. It is likely that it will be wireless and very portable. The laptop of today will be replaced by a more powerful PDA that will be able to access databases, on-line reports and so forth via a wireless connection. It will also be able to do many of the things that current desktops and laptops do now. Think this is far in the future? Within the last year (2001-2002) Harvard Medical School went to a PDA based system for all of its students (Rosenberg, 2001) . Several other colleges and universities have already done the same. The further development of the Internet, coupled with the potential of wireless communication and on-line databases, makes the handheld computer a very good scholarly tool. Dertouzos (1997; 2001) argues that the outcome of all this may include wearable computers (see also Frishberg, 2002, October 10; 2002, October 15).

Specialized and customizable *scholar-bot* programs will search out material that we can use in our work. (Dertouzos, 1997; 2001; Gates, 1999).The material will be cataloged and indexed for our use and fed to us through the PDA. In addition to these, we will have communication with scholars all over the world.

Moving with this, technology that supports scientific visualization will continue to improve and evolve. The Census Bureau has already incorporated the results of geo-synchronous satellite imaging into its place definitions in such a way that they can now estimate the rural populations inside MSA's (Metropolitan Statistical Areas). And who has not used MapQuest or similar products to find the location of hotels and conference sites in distant cities? Presentation technology will evolve in quality, interactivity and ease of use.

Conclusion

What will all of this do to non-profit scholarship? In the first place, it might break down some of the barriers between scholars and practitioners. It would, in the process, weaken the rationale for the university. The ultimate

replacement would be an on-line community of practice integrating scholars, practitioners and other stakeholders into the process. Combined with on-line learning, this could be the new university, very much like the deschooling society that Illich (1971) called for three decades ago. Unfortunately, creating a funding model for this arrangement might be easier said than done. What is more likely is that the university will become different, more responsive and possibly more inclusive.

Scholarship is different from many other kinds of knowledge work. It requires the kind of personal passion that is not often seen in other areas. This is not, however, to argue that technology cannot make the scholar's job more productive and rewarding. We have seen that as technology has developed it has improved the quality of scholarly work.

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