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Electronic Dissemination of Scholarly Work

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Abstract

Throughout the years scholars have developed and used a variety of means for disseminating their work. This article examines journals as a means of disseminating scholarly work. Initially, it examines the history and nature of paper journals. Also it discusses electronic journals and their promise for a substantial increase in the effectiveness of scholarly communication. Finally, it describes the Journal of Information Technology Impact, an online scholarly journal that provides a forum for exchanging information on the social impact of information technologies.

Keywords: electronic journals, paper journals, disseminating scholarly work, Journal of Information Technology Impact.

Introduction

A fundamental premise of scholarly work is peer dissemination. Throughout the years scholars have developed and used a variety of means for disseminating their work. In each era the scholarly communication tools were greatly impacted by the respective status of technology. Oral communication, scribal manuscripts, typewriting, manual typesetting, and electronic typesetting are all artifacts of an evolving technology.

In recent years, books, journals, lectures and conferences formed the mainstream channels for scholarly communication. Nowadays, technology and in particular information technology (IT) is impacting each of these communication systems. Electronic publishing, electronic text, voice-based messaging, and video conferencing are a few examples of information technology's impact.

Information technology gave us new ways of communicating but mainly gave us the opportunity to refine and improve existing communication systems. This can be easily seen by the transition from manual typesetting systems to electronic ones. Today, at the present end of this evolutionary path, is the development and gradual growth of electronic journals which are mainly developed based on the existing and well understood norms of paper journals.

This article concentrates on journals as means of disseminating scholarly work. The first section examines the history and nature of paper journals. The second section discusses electronic

journals and their promise for a substantial increase in the effectiveness of scholarly communication. Finally, the last section describes the Journal of Information Technology Impact, an online scholarly journal that provides a forum for exchanging information on the social impact of information technologies.

Paper Journals

For centuries the main format for scholarly communication was scribal manuscripts. In the fifteenth and sixteenth centuries commercial printing gradually displaced scribal manuscript production but scholarly work did not find its place in the commercial printshops. The technical nature and small audience of scholarly work made it unattractive to commercial printing and posed a problem to scholars who could not find publishers to publish their work. Since the normal market could not support scholarly publishing, academic institutions launched presses with one of their main missions being to publish scientific journals. In 1878 Daniel Coit Gilman, president of Johns Hopkins, established the first academic press (Hawes, 1967).

For more than fifty years academic presses formed the main avenue for disseminating scholarly work. This changed in the middle of the twentieth century; during World War II, the government poured money into scientific research, which became a golden opportunity for commercial printing. It was the time when entrepreneurs like Robert Maxwell with his Pergamon Press embraced scientific journal publishing (Bronson, 1999). Eventually commercial printing got the lions share in this business at the expense of academic presses (Thatcher, 1996).

Nowadays paper journals are a commercially proven medium of scholarly communication because they rely on well-established, well-understood rules and procedures. Hofmann (1995) lists the following stages for creating a journal; a) Solicitation for papers; b) Receipt and review by a group of experts; c) Editing; d) Typesetting; e) Printing, and f) Distribution via the mail. Operating in this mode for more than a century, scholars understand and accepted those rules and procedures. The entire process of journal publishing matured to the point that became the norm for scholarly publishing.

The majority of traditional fields have a few high status journals that are widely read within their own scholarly community. Analysts believe that a small number of scholars (between five and ten percent) publish in those journals (Kling and Covi, 1995). Usually, those scholars are well connected within their own scholarly community, they are affiliated with institutions that have a vigorous research orientation, and they publish in order to disseminate major research findings. The remaining number of scholars publishes a relatively small number of papers in lesser-known journals. Those scholars publish so they can satisfy job advancement requirements or simply feel part of the scholarly community. Regardless of the reasons that scholars publish, the ever-increasing number of scholars, the ever-increasing body of knowledge, along with the adoption of scientific publishing by commercial presses, led to a proliferation of journal publications.

Since World War II we have observed an explosion in journal publications supported by either commercial publishers, academic institutions (usually university presses), or professional societies. The number of scientific papers published annually has been doubling every 10 years or less depending on the discipline (Odlyzko, 1995). For example, in 1870, Mathematics (an old

discipline with extensive literature) had about 840 papers published; today, we have an annual production of 50,000 papers (Groetschel, Luegger, and Sperber, 1994). Odlyzko (1995) predicts that the rapid economic growth and better education in countries such as China and India will increase the ranks of scholar and thus continue the growth in paper production.

The exponential growth in scholarly publishing coupled with the increasing costs of journal subscriptions is creating tremendous economic pressures on the institutions and agencies that traditionally support scholarly activity. This is more evident in academic libraries that struggle with journal costs and are unable to provide what academics need to keep up-to-date with their colleagues around the world (Kiernan, 1998). Libraries are trying to cope with the increasing volume and cost of journals by cutting back on subscriptions, but this results in fewer subscribers which in return increases subscription costs even further (Lynch, 1994).

Information technology as a communication medium with promise of low distribution cost offers an opportunity for easing off the accumulated economic pressures. For the past ten years the low distribution cost, and added features such as searching abilities, leads to the gradual transformation of scholarly journals into electronic journals.

Electronic Journals

In contrast with paper journals, an electronic journal is one that is distributed to most of its primary subscribers in electronic form. As with most changes, the appearance of electronic journals followed a gradual evolutionary path. Electronic publishing started with email. Email evolved to listservs, then newsgroups, ftp and gopher servers, and now web servers. Scholars used email, listservs and newsgroups to describe their latest findings and ideas, and to trade data and drafts of articles. Ftp and gopher servers were used for disseminating articles before they were published. Today, web servers host full electronic journals.

The history of scholarly communication via email, listservs and newsgroups can be traced to the very first day of existence of those tools. Ftp and gopher servers were used as scholarly publication tools for preprints. In certain disciplines, preprints are a vital component of the scholarly communication; therefore, when ftp and gopher servers demonstrated advantages as communication media, scholars in those disciplines did not hesitate to use them. The first such use is recorded in mid-1991 when Paul Ginsparg of the Los Alamos National Laboratory in New Mexico developed an archive for electronically-published preprints of papers ultimately destined for the pages of the physics journals (Ginsparg , 1997).

In the early 90's, as soon as the web was developed, the academic community quickly realized its potential as a dissemination medium for scholarly work. Mathematics was the first discipline to produce an electronic (online) journal in 1993 (Odlyzko, 1995). Since then Mathematics has generated the largest number of online journals of any field. In September of 1994, the Institute for Scientific Information (ISI) accepted its first electronic journal, *The Online Journal of Knowledge Synthesis for Nursing* (Testa 1998).

Enumerating electronic journals is not easy, since there is no single authority to act as a centralized registry or librarian. Today, the Association of Research Libraries (ARL) keeps the most complete information on electronic journals. In 1998, ARL found 1,465 electronic journals of which 1,002 were peer-reviewed as opposed to 47 peer-reviewed titles in 1996. Twenty nine percent of the 1998 titles were scientific journals, 14% were categorized as arts and humanities journals, while 28% were social science titles (Association of Research Libraries [ARL], 1998).

The increasing number of electronic journals is attributed to either completely new journals or existing journals that have been transformed into electronic form. The latter kind usually supplements or replaces existing paper journal from commercial publishers. As with paper journals, electronic journals come from three main sources: commercial publishers, learned societies and academic institutions. Unlike paper journals, when academic institutions initiate electronic journals, the publishers are not university presses. Instead, individuals, departments or special-interest groups often initiate electronic journals (Hitchcock, Carr, and Hall, 1996)

Electronic publishing has many advantages besides easing the economic pressures of scholarly publications. A range of innovations and features has become possible with electronic journals that are either impossible or difficult to achieve with paper journals. Immediate dissemination, interconnectedness, forum like interaction, and searching abilities are some of the characteristics that can give electronic journals an edge over their paper counterparts.

Immediate dissemination is one of the strongest characteristics of electronic journals. It's possible to publish non-refereed articles within hours of finishing them. Peer reviewed papers would still take longer, but as soon as they go online they can be available to everyone interested. This way, scholars in remote locations of the world could have the same access opportunities as with scholars that live in the same town that the journal is published.

Electronic journals can offer interconnectedness within an article, such as between the text and footnotes or between the article and other related articles. Additionally, they can facilitate a forum-like interaction by allowing readers' comments to be attached to the articles for anyone to read. Publishers can provide bulletin boards or chat-rooms where readers and the authors can discuss controversial articles.

Journals can escape the volume/issue mode of operation. Electronic journals do not need a certain number of pages before they can be published. Articles can appear when they are ready. This, also, impacts the economics of journal production. Currently the cost of paper journals is directly linked to the number of pages; therefore, publishers hesitate to exceed predetermined page limits. Electronic journals can keep adding article "pages" at the cost of production but with negligible additional cost for distribution.

Additionally, the use of electronic publications can be easily monitored. This is particularly important to consumers such as libraries for justifying subscription costs. Searching for articles on a topic becomes as easy as clicking on a search engine. With electronic publishing, motion, animation, simulation, and interaction are all possible. None of these are possible with paper journals.

All of the above capabilities are possible today but electronic journals rarely use them. Currently, they may use various digital formats -- such as ASCII, Hypertext Markup Language (HTML), Portable Document Format (PDF), postscript, bitmap, and others -- for presenting content, but their presentation and procedures resemble paper journals. The majority of electronic journals operate in an issue/volume mode, they rarely employ motion, animation, or simulations, and they don't post reader's comments. Although we already have a good number of journals available in HTML format, an electronic format that by definition facilitates hyperlinking, very few of the journals publish articles that are highly interconnected.

The current "paper mode" of electronic journals can be explained by the following reasons. First, since the development and gradual growth of electronic journals are the product of an evolutionary path that stems from paper journals, it is natural that early electronic journals will operate in a similar manner as their paper counterparts. As mentioned, electronic publications today come from commercial publishers, learned societies and interested individuals or small units at academic institutions. Both commercial publishers and learned societies have a long history of offering paper publications; therefore, it is only natural that when they went electronic their product resembles their paper publications. If a radical change was to happen by developing electronic publications that utilize and take advantage of most of the capabilities that the electronic dissemination may offer, then one would expect that this change would naturally come from individuals and small academic units that have developed electronic publications. Unfortunately, those groups are lacking the financial resources to implement such capabilities; therefore, they too produce inexpensive, "plain vanilla" electronic publications that resemble paper.

Perhaps the most important reason for operating in "paper mode" is that the audience of electronic publications expects it. Even if commercial publishers, learned societies, and academic institutions were in the mind-set and had the resources to produce electronic publication with revolutionary features, scholars would initially consider them of lesser intellectual quality. Scholars see refereed paper publications as a means for insuring quality and validating content; therefore, they may resist any new process that tinkers with the existing mode of operation. Even with today's gradual evolutionary transformation of journals into electronic form, some scholars question the integrity of electronic journals. They forget that journals reflect the views of their editorial boards and associate article quality with delivery medium rather than with the quality and procedures of the boards.

Today established paper journals continue to attract the majority and best papers. Kling and Covi (1995) observe that the most successful electronic publications are the ones that resemble paper journals, but this is changing gradually. As time passes, electronic journals are recognized as legitimate outlets for scholarly communication (Odlyzko, 1996). Credibility gains are attributed to the normal passage of time, but also received a major boost when commercial publishers started converting existing, well-established journals into an electronic format. A notable example of such massive conversion comes from multinational publisher Reed Elsevier with its TULIP project (Lynch, 1995). As credibility rises, electronic journals will be free to gradually take full advantage of all the features that they are capable of. Then we could say information technology can revolutionize scholarly communication.

The impact of information technology on scholarly communication will be profound as it will be on all aspects of our lives. In the coming years information technology will deeply change the way we do business, socialize, entertain, and educate ourselves. Then, our task will be to promptly recognize the forthcoming changes (not an easy task considering the speed of change) and to find solutions to the myriad of new problems that the changes will bring. Having that in mind, we established the Journal of Information Technology Impact, a scholarly journal that aspires to provide a forum on the social impact of information technologies.

The Journal of Information Technology Impact

The Journal of Information Technology Impact (JITI) was established in 1997 by the Computer Information Systems Department at Loyola University New Orleans. It is a scholarly, peer refereed journal that provides a forum and means for exchanging information on the social impact of information technologies. JITI's scope includes the effects of information technology on business, socialization, entertainment, and education. The Journal publishes original research articles, short experimental reports, review monographs, technical notes, as well as special, thematic issues with commentaries.

Objectives:

The objectives of the Journal are to:

- Explore the effects of theories or implementation of information technology.
- Inform readers about innovative computer technologies and processes.
- Provide CIS practitioners and educators with substantive, new insights into the design of computer information systems.

Audience:

The Journal is unique in providing a diverse forum for those interested in the effects of theories or implementation of information technology. It, therefore, promotes an exchange of information between groups not always thought to share a common interest. In general, JITI is designed for the following audiences: researchers, developers, and practitioners in schools, industry, and government; administrators, policy decision-makers, and other computer specialists.

Format:

JITI is registered with the National Serials Data Program (NSDP) at the US Library of Congress. The Journal is distributed mainly via the Internet (www.jiti.com). However, periodically a CD-ROM version will be made available for archival purposes. Currently, JITI is supported by internal university grants and will be available free of charge during a trial period of two years. After this initial period, charges to recover the costs of running the journal will be collected. Initially, it will be available in a format that resembles paper journals; but as it gains credibility and financial resources permit, it will take full advantage of all the features that an electronic communications medium is capable of.

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