Can and should the electronic publisher play the same gatekeeper role in electronic scholarly journals as is the case with traditional publishers in paper-based publications?

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Introduction

The reduction in book reading rates has been alluded to in a number of recent publications examining the impact of technology on the publishing industry (Torr; Melanson). This trend has been reflected in the arena of scholarly journals as well since researchers frequently subscribe to both electronic and print versions but make more use of the electronic access on a daily basis. To explore the impact that the electronic environment has had on publishing, specifically in the area of scholarly journals, it is essential that we begin by clarifying some of the concepts involved. Since electronic publications have had a significant impact on the traditional bibliographic chain this article also discusses a proposed model for electronic information flow. Specific emphasis has been placed on the scholarly journals and this area will be discussed in association with the role of the electronic publisher. Finally the article will explore the status of 'gatekeeper of information' in relation to electronic publication.

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Definitions: publication, electronic publication, publisher, electronic publisher, Webmaster

Publication
The act by which a thing is made public including the distribution of copies of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending. The offering to distribute copies to a group of persons for purposes of further distribution, public

performance, or public display, constitutes publication (The 'lectric Law…). The noun 'publication' however refers specifically to the work, for example book, journal magazine, newspaper, etc. which is published. In the scholarly arena a publication also includes peer-reviewed articles and preprints (Frankel, Elliot, Blume, Bourgois, Hugenholtz, Lindquist, Morris & Sandewall, 2000).

Electronic publication
An electronic publication encompasses the definition of publication above but simply specifies the medium for transmission and distribution. For scholarly articles published in electronic format the following criteria hold for a 'definitive publication' (Frankel et al., 2000):

- The published article must be publicly available.
- The appropriate associated community must be made aware of its existence.
- Long-term access and retrieval must be ensured by a suitable system.
- No changes must be made to the published article (technical protection and/or certification are desirable).
- The published article cannot be removed (unless legally unavoidable).
- It must be unambiguously and uniquely identified (e.g. by a SICI or DOI).
- A bibliographic record (metadata) must be in place containing certain minimal information.
- Provision must be made for archiving and long-term preservation (Frankel et al., 2000).

Publisher
Various definitions exist for this concept but essentially a publisher is 'an individual or organization involved in the publication and dissemination of material' (Palaeontologia Electronica, 1999) or stated differently 'a person or thing esp. a company that produces and distributes publications for public sale'(The Concise Oxford Dictionary, 1995). Stated more basically a publisher is 'the reproducer of a work intended for public consumption' (Webster's International Dictionary, 1965).

Electronic Publisher
The term electronic publisher has been defined as 'any person, corporation, company, association, joint stock company or association, or partnership which is primarily engaged in the provision of electronic publishing services' and includes applying solid and dependable new technologies to assist consumers (Senate Committee Substitute.., 1994; Jensen, 1996).

Electronic publishing services include the 'generation, dissemination, provision, publication, or sale by an electronic publisher, by way of network interconnection with a telecommunications company, to any person of any information which the electronic publisher has or has caused to be originated, authored, compiled, collected or edited or in which the electronic publisher has a direct or indirect financial or proprietary interest. Electronic publishing services include, but are not limited to: news; business and financial reports; editorials; electronic information directories; columns; sports reporting; features; advertising; photos or images; archival and research material; legal notices and public records; scientific, education, instructional, technical, professional, trade or other literary material; and any other similar information.'

Webmaster
A Webmaster (sometimes 'webmistress') is an individual who either:

a. creates and manages the information content (words and pictures); and organization of a Web site and hence has a role to play as an electronic publisher.

b. manages development and maintenance of the computer server and technical programming aspects of a Web site; or
c. does both (General computing terms, 1999).

The term does not imply any particular level of skill or mastery (Free online dictionary of computing, 1999).

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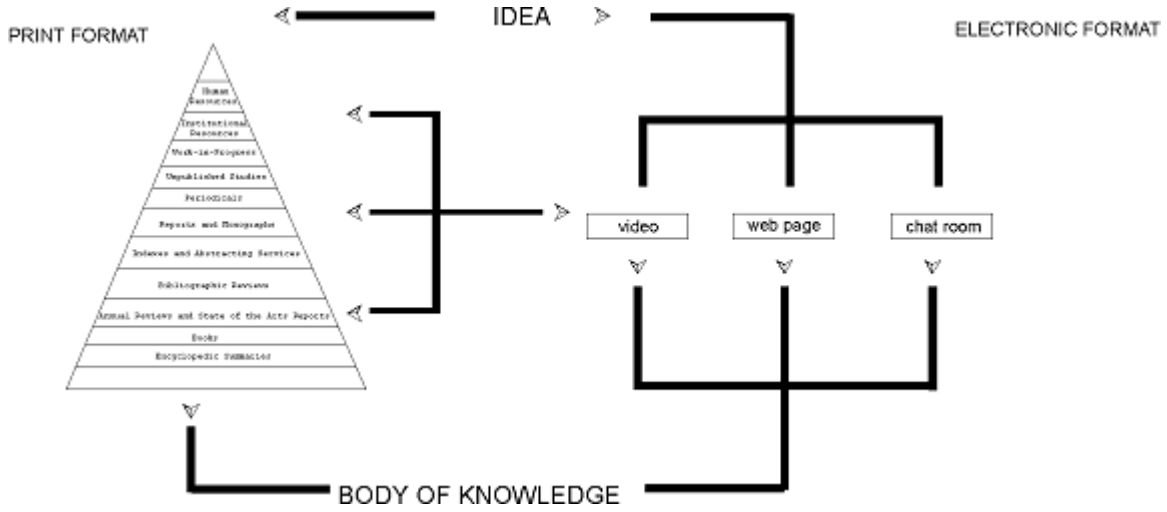
Electronic information flow

The explosive growth of the World-Wide Web has had a dramatic effect on the availability of electronic information as opposed to traditional (paper-based) formats. The full implications of this event are still being processed, and how authors and publishers will ultimately relate in this environment remains to be seen. Currently information is being packaged by different originators and these vary from large publishing houses to individual or personal publishers such as a scholar or scientist who publishes a journal article on a personal Web site. The publisher however needs to determine the format of the publication in accordance with the purpose and target audience for the work. Readers (or end-users) need to find relevant information in a suitable publication format and a role of the publisher is to determine what the suitable format and location should be. A variety of models have been used to categorize information formats in general but few address the electronic information environment. An attempt was made to develop a model for electronic information flow by amending a model for traditional (paper-based) information flow produced by Doyle and Grimes in 1976. Essentially the model examines the process through which an item of information progresses as it moves from its creation in an individual's mind to its potential resting place in a publication, in other words it reflects the bibliographic chain (Doyle & Grimes, 1976).

As was expected, the diversity of electronic information formats does not fit the model of Doyle and Grimes. Proposed changes to their model are depicted in Figure 1. In effect the term bibliographic chain becomes redundant since it implies a hierarchical and linear process for the publication of material. This may have been the case prior to the advent of the World Wide Web (WWW) but the varied range of electronic formats, in combination with the ability to circumvent the standard print publication process, means that electronic publications fall into a completely new genre.

The bibliographic chain model also assumes that all information which survives the process of integration into the published arena will eventually find its way to an encyclopaedic summary. The idea of categorizing the vast amount of information available in electronic format is mind-boggling. This is not simply due to the technical considerations of coping with the task but also, because of the dynamic nature of the Web, hundreds of resources become defunct daily so trying to keep up with these changes would require a daily encyclopaedic summary to be made.

Figure 1 Proposed model for information flow for print and electronic formats



Doyle and Grimes state that the 'substance of these other media forms is normally identified, discussed and analyzed in print'. This statement is not strictly correct in the electronic publication environment because although various printed Internet and PC magazines discuss and mention sites of particular interest, the main process of identification, discussion and analysis happens in the virtual Web environment in forums such as chat rooms and newsgroups and the majority of these contributions are never seen in printed format.

The Doyle and Grimes model also assumes a chronological movement of information through distinct stages. From the moment an idea is conceived till it reaches a forum where it is included in the generalized encyclopedic summary of a subject field, is assumed to be a time-consuming process. In addition, certain publications which do not make the grade are excluded with time since they have already been included in the forum in one way or another. While the latter scenario still applies to electronic publications, the speed at which these items are excluded from the summaries is dramatically faster. The amount of time taken to publish an idea on the Web is virtually negligible when compared to the printed format as the ability of an individual to post his/her ideas onto the Internet via his/her own home page bypasses the whole print chain.

The arrows depicted in Figure 1 represent the dynamic nature of the interaction between printed and electronic formats. This interaction can best be illustrated by an example. Let us say, for example, that some entrepreneur has the idea of inventing and selling an automated dog-washing machine. He now has several options depending on whether he chooses the printed format chain or the electronic format environment.
Option 1: If he selects the printed format he can send the idea to a publisher of a printed publication for inventors or a daily newspaper and hope they respond or print his contribution in their next edition.
Option 2: If he selects the electronic format he can post his idea on his Web page and include a videoclip of how clean his dog is after using the machine. He can also post his idea to a chat room or newsgroup for inventors.

He might eventually receive some response using Option1 but he can definitely benefit by choosing Option 2, preferably in conjunction with and not excluding Option 1. With Option 2 his idea is potentially immediately accessible by thousands of Internet surfers. The chat rooms and newsgroups can provide an immediate response to his invention, whether it is positive or negative. Should the invention catch the eye of an editor for a printed Web related magazine – it is possible that it could be included in printed format in any case.

Items appearing in printed format can also feed the electronic format environment. This is especially true of newspapers and journals since it is a popular trend to have these publications accessible over the Internet. In a similar manner, Internet resources often are

included as references in journals. The electronic format environment includes the entire spectrum of printed formats namely work-in-progress documents, unpublished studies, periodical articles, reports and monographs, etc. but in addition it adds value to these publications by being accessible in an interactive manner. The Internet has also facilitated communication between the different tiers depicted in the Doyle and Grimes model through the use of e-mail.

Take for instance a scientist involved in research. Before the WWW, the work-in-progress of other scientists was essentially hidden until it was published. Now scientists have the opportunity to use project databases on the Web to present their research to the scientific community long before they produce any printed publications. E-mail also allows contact and information exchange without involving any printed material. Another trend is that scientists avoid having their research published in print at all by simply writing their articles for the Web. This ensures that no copyright fees are charged and information is available freely to those who want it. This is particularly relevant to the African context since most peer reviewed journals of high impact are printed overseas and ordering articles from the publishers is extremely expensive.

The concept of the body of knowledge represented by Doyle and Grimes has a far narrower view in the context of printed documents than in the electronic environment. The integration of these environments produces an ideal forum for information dissemination and for nurturing intellectual growth.

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Impact of the development of scholarly journals on the electronic publisher

The scholarly journal mainly communicates the work of scholars, academics, and researchers, and it contributes to the development of ideas that build a knowledge base, an essential output of any scientific endeavour. Electronic journals are usually delivered via networks, although they can be locally owned through a static electronic format such as CD-ROM (Okerson, 1991)

According to Rappa (1998), scholarly communication can be represented in a multi-stage process involving:

1. creation – scholars create new knowledge;
2. validation – the validity of new knowledge is assessed by peers;
3. production – validated knowledge is edited, typeset and printed in journals;
4. distribution – journals are distributed to research libraries and individual subscribers;
5. storage – journals are archived in libraries;
6. reproduction and redistribution – articles are copied as needed and circulated to scholars; and
7. verification and integration – scholars refute or uphold findings and incorporate them in their creative work.

Journals support this multi-stage process by communicating information, validating quality, distributing rewards and building scientific communities. The advantages of e-journals when compared to print versions are the fpllowing:

- Speed: academic discourse can occur more rapidly since the production of e-journals is much quicker than for a printed version.
- Interactivity: Interactive discussion is supported in the electronic environment and comments on existing articles can be made online.

- Accessibility: Wherever there is an Internet connection, the articles can be read.
- Costs: Readers only need to pay for the articles they want, which is cost saving both directly and indirectly since information overload is controlled.

There is a fundamental change in the world of scholarly publishing and libraries as they shift from paper-based to electronic formats. While almost all academic journal articles and books are now produced in electronic form, the majority are sooner or later printed on paper for sale or distribution to their readers. The driving force for electronic publishing and digital libraries is the objective of capturing the author's creations speedily but also to enable rapid transmission to potential readers without following the path of paper formats, even if there is significant editorial structuring and filtering. Academics do experience practical problems when working interactively with e-journals mainly because e-journal articles are hard to read in many common workplaces (such as laboratories) unless they are printed on paper – it is not a simple matter to highlight text of relevance and make notes on the margins! The primary consideration for scholars and academics, though, is that publishing exclusively in electronic formats has yet to become legitimate in research universities. Furthermore only a few university libraries have explicit collection development policies and systems which enable them to systematically archive specific e-journals (Kling & Lamb, 1996).

Workers in the field of scholarly publishing have been examining what it means to be a university press publisher in the current information age. As noted by Wittenberg, 1998, the majority of academic libraries and publishers, faced with financial constraints and new developments in digital technologies, have been forced to address some very basic questions such as:

- What role do publishers fulfil in the broader scholarly community?
- How can publishers ensure the continual publication of high-quality work f or which they have been renowned over the years of university press publishing?
- It what way can publishers reconcile the new realities of the digital economic environment with the goal of publishing the best work being produced?
- Which developments can assist publishers in achieving their goals?

On any discipline-based Web site, which includes publications such as books, journals, conference proceedings, and working papers, the aim is that readers can locate and utilize relevant material quickly and easily in one place. The role of the publisher thus remains that of identifying and developing the most relevant and significant work in a field. However, the process of organizing, coding, linking, updating, licensing, and maintaining that wide range of material takes on new significance. Wittenberg (1998) suggests that in the future users may look to particular publishers to maintain vast amounts of scholarly material online in a specific field, rather than seeking out particular publishers for certain publication formats.

Technological developments should not simply be used to duplicate print publication in a new form, but rather, publishers need to consider how technology can reveal new opportunities for the way in which scholarly information is created, presented and disseminated. When taking into account online publications, Wittenberg (1998)states that the following issues need to be considered:

- Will the material that is being published be subject to specific timeframes?
- Is it scholarly material that is not otherwise easily accessible?
- Is there value in publishing in one location working papers, articles, conference proceedings, books, or other forms of publication in a particular field?
- Will users welcome the opportunity to retrieve that material in an online format?
- Are links to other material useful for scholars in this area?
- Is it necessary or helpful for users to have access to research materials from a variety

of locations?

The goals of publishers of scholarly journals should be to understand how scholars and libraries use online publications, and what type of publications are most useful electronically (books, journal articles, working papers, etc.). They should also examine costs throughout the life-cycle of the publication and test whether scholars receive professional recognition for publication. In addition publishers should analyse user responses and sales results from subscribers to determine the effects on a print publishing operation of incorporating an online model. These goals can be approached through questionnaires, user interviews, and focus groups conducted after the publication is laynched (Wittenberg, 1998).

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Electronic publisher as gatekeeper of information

A 'gatekeeper' has been referred to as a conduit who passes on information or gives limited access to information. Some literature (e.g. education and journalism) has used the term disparagingly to represent an individual who withholds information in either a formal or informal organizational setting (Metoyer-Duran, 1993).

Metoyer-Duran (1993), indicates that the literature on information gatekeepers can be divided into four categories:

1. The human gatekeeping concept as developed and applied within different disciplines and fields.
2. Gatekeeping within the context of information-seeking behaviour which includes information-use models, such as taxonomic models in communication and education research.
3. The cultural dimensions of information-seeking behaviour.
4. The information-seeking behaviour of gatekeepers in ethnolinguistic communities.

To perform their roles effectively publishers will still be gatekeepers in one or all of the abovementioned categories since the influences of technological developments redefine these areas constantly. In terms of gatekeeping and information-seeking behaviour, electronic publishers still have a part to play – not by restricting access but by making access easy by identifying and providing only what is needed by the end-user. Publishers need to consider market needs, the importance of the editorial function, or other issues that have brought success in the past. Technology will continue to change and develop, and, unlike bound volumes, the electronic formats we are producing now will look archaic in ten years. The challenge now is to create content for the future inspired by the technology of the moment.

How the electronic revolution has impacted publishers was articulated in June 1992 by Richard Snyder (Arnold, 1995): "We're not just a publisher anymore, but a creator and exploiter of copyrights. We sell information in any form, in any way you want it.... We are out of the confines of print, although that doesn't mean we are out of the print business. We can sell the same information in various forms. We can take any piece of information – a college textbook or a Securities and Exchange Commission filing – and sell it in print, on line, on CD-ROM, on film, and on interactive laser discs." This new kind of publisher makes available to the user only the information the user wants when the user wants it and in the most convenient form. This ability to specify, target and individualize information is at the core of the electronic revolution. Since the World-Wide Web serves as a vast resource for up to the minute information, and is accessible virtually globally, it immediately lends itself to exploitation by people who are going to want to control the flow to suit their own purposes, not the purposes of the supplier (i.e. the publisher). This new set of circumstances challenges

the way in which publishers have traditionally thought (Arnold, 1995).

According to Arnold (1995), the advances in technology have called into question the value publishers have added to the traditional work of scholars, whether disseminated in book or journal form. A future scenario that omits publishers or intermediaries between writers and readers altogether has already been bandied about. This would leave the writer to publish and archive his/her material in the electronic environment. It has also been suggested that some form of intermediary will be required but that he/she will emerge from the present library system and combine the functions of publisher and librarian in one agency.

By making it easy to display and read texts online, the WWW has become a platform for materials that were too specialized, too ephemeral or too experimental for publication as traditional books or articles. In the world of for-profit publishing, cost-effectiveness is a harsh gatekeeper and takes precedence over quality. However, a text that could never be published by a reputable publishing house can now have its day in the sun on the Web and who (if anyone) will ultimately control and monitor what gets formally published remains to be seen. In the long term, technology will in all likelihood provide a solution to this dilemma.

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ISSN 1560-683

Published by InterWord Communications for the Centre for Research in Web-based Applications, Rand Afrikaans University