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Abstract

This paper introduces a comprehensive research framework for academic electronic publishing (AEP). Eisenhart (1994) suggested a framework to study and guide commercial electronic publishing. Considering the unique nature of academic publishing, Eisenhart's framework is extended to include social, managerial and economic factors distinct to academia. The framework leads to a set of guidelines. The guidelines are applied to the new Communications of AIS. A longer version of the paper is available.

Introduction

Traditional academic publishing faces significant obstacles such as time lags and distribution costs. In fast-changing disciplines like Information Systems (IS), a delay in publication can make ideas and issues outdated before they reach print. Fast changing disciplines require equally fast ability to disseminate information to academicians and to practitioners while maintaining the quality of the information and the clarity of the writing. Electronic publishing (e-journals) is a potential solution to the time lags experienced by traditional paper journals (p-journals). E-journals can reduce the cost and time to print. However, they introduce many new issues and problems. For example:

– How to control publication's quality?
– What is the best medium for electronic publishing?
– How to protect copyrights?
– How to manage priority claims?
– How to maintain and manage original manuscripts?
– What type of a fee structure will be most appropriate?

The paper begins with a brief review of a framework by Eisenhart (1994) for the publishing industry in general (section 3). Section four presents a research model for AEP and factors to be considered in implementing e-journals in academic environment. The last section applies this framework to a new e-journal.

Publishing Framework

Eisenhart (1994), in *Publishing in the Information Age*, describes the seven M's (factors) that drive the publishing industry. Five of the M's are unique to publishing:

– The *Material* describes the content or the subject matter of the published work.
– The *Mode* is the set of symbols and language used to present the published material. Mode can be textual, visual, or aural.
– The *Medium* is the sets of tools used to store and display the published material. The material and the mode, in many cases, depend on the medium.
– The *Means* describe the way articles are delivered or distributed. Publications may be distributed physically or electronically. The means of distribution is dependent on the medium used.
– The *Market* includes all customers and users, direct or indirect.

These five M's, in Eisenhart's framework, are unique to publishing. The last two M's are general to all businesses:

– *Money* refers to the economics of publishing.
– *Management* refers to the decision-making process.

An extended framework for AEP that accounts for the unique characteristics of academia is presented next.

A Framework for AEP

Figure 1 shows an adaptation of Eisenhart's (1994) general framework to AEP. Examples are given for each element of the framework. The framework expands on the original seven M and adds an eighth M.

The <u>*Material*</u> published in academia is currently limited to research published in the form of articles and books. Space limitations and cost of distribution prevent publications of additional material (e.g., computer programs, algorithms, color photographs) and limits other work such as literature surveys, opinion papers and tutorials.

The <u>*Medium*</u> used in academic publications is primarily paper. Various efforts exist to convert academic publishing to electronic based media. The availability of the Internet and of CD-ROM introduces two potential new avenues for AEP. Each medium has its (dis)advantages (Hovav and Gray 1997).
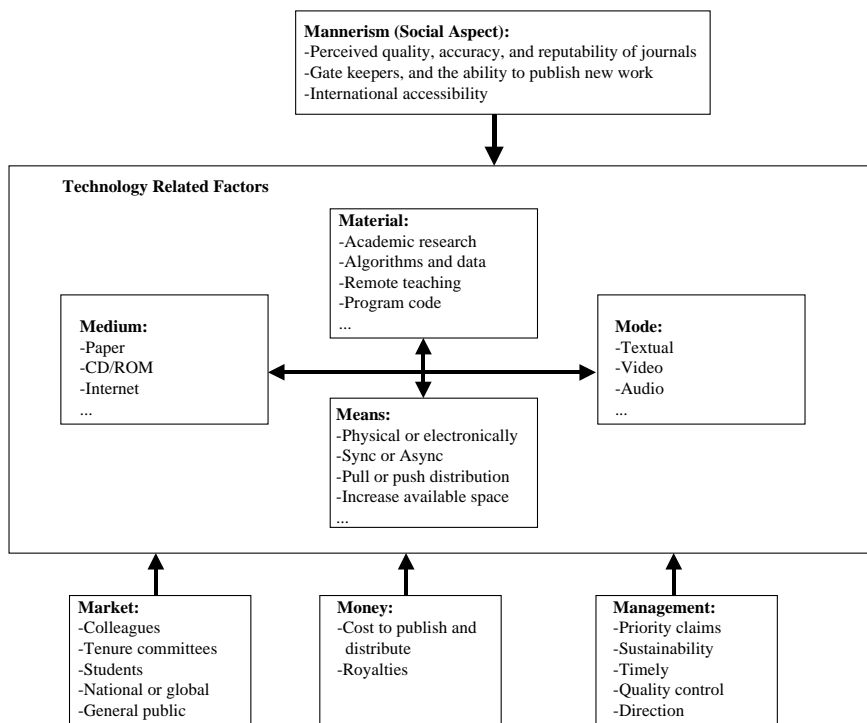
The *Means* of distribution depend on the media used. CD-ROM and p-journals are distributed physically and periodically. Internet-based e-journals are distributed either periodically or on demand.

The *Mode* also depends on the medium. Presently, most p-journals are limited to black and white text with limited graphics. E-journals introduce additional modes like color graphics, audio, video, and images. Higher dependency of the mode on the medium limits the ability to reproduce the article.

The first four M's, Material, Means, Medium, and Mode are factors and issues related primarily to the technology used. These four M's are interrelated and essentially depend on the medium.

The second set of M's that influence AEP relates to the Managerial, Market, Money (economics) and Mannerism (social aspects) of publishing.

The *Market* of academic publishing is essentially limited to the academic community. An objective of AEP is to increase the marketability of academic work

Figure 1. Academic Electronic Publishing Framework

to practitioners. A significant customer of p-journals is the tenure committee member, who demands special attention in AEP.

Money, Academic journals are traditionally published by non-profit professional associations; educational or research institutes; and commercial publishers. Gold (1994) concluded that electronic publishing might benefit publishers. Work can remain active longer, marginally profitable work (like dissertations) can turn beneficial and cost of production and distribution can be reduced. Gold (1994) concluded that electronic publishing would not erode sales. The indirect cost associated with collecting and refereeing material is more difficult to control than the cost of production and distribution. Copyrights and royalty payment structure will have to be changed. For example royalty payments may be based on the number of authorized accesses to a manuscript. AEP outlets may have a different fee structure. Pull technologies, like the Internet, allow a multilevel fee structure. E-journals that are associated with professional societies can use a membership charge mechanism to collect subscription fees.

The *Management* of AEP has duties beyond the preparation and distribution of the material published. The main objective of academic publishing is to build collective knowledge, communicate information, validate the quality of the information, distribute rewards and build scientific communities (Schaffner 1994). To fulfill these roles, the management of AEP must ensure that e-journals, like p-journals, are (1) sustainable, (2) accessible, (3) timely, and (4) reputable (accurate and of high quality). In electronic publishing, these criteria lead to new management issues.

- *Sustainability* – An important factor of citation and collective academic knowledge is the long-term sustainability of access to manuscripts. Particularly, for Internet journals, permanent archives need to be established by publishers so that referenced articles can be retrieved by future scholars.
- *Timeliness* – One objective of AEP is to reduce publication cycle time. AEP can shorten the publication cycle, to an extent, if work is published when it is accepted. However, AEP does not guarantee reduced writing, refereeing, and editing periods and therefore may only marginally reduce the time to delivery. Priority claims are important in academia and are part of the timeliness issue.   One of the functions of journals is to establish priority claims. Presently, priority claims are established either through date of publication or date of submission. AEP will need to keep track of this information and make it available.
- *Quality Control* – Quality control is an important element in publication. Unfortunately, refereeing is a large portion of the publishing cycle time. AEP offers the opportunity to reduce refereeing time (Mandviwalla, 1997).
- *Accessibility* – Casual readers are rare for academic journals. AEP has the opportunity to increase accessibility to practitioners and the general public through the extensive indexing capabilities available.

The last M of AEP that we add to Eisenhart's (1994) framework, is the *Mannerism* (social aspect) of AEP. This factor deals with the "soft" issues of AEP. For example, the *Perceived* quality, accuracy, and reputability of e-journals is considered by many to be inferior due to lack of control and low standards on the Internet, regardless of the mechanism used to control quality of a given e-journal. This perception is difficult to manage and change. For example, a majority of tenure committees do not accord

e-journals the same weight as p-journals even when the e-journal is refereed and follows the same acceptance procedures and quality requirements as p-journals.

International access is another example of social aspect. We cannot assume that the electronic publishing revolution is global (Jacobson 1994). Many countries lack the infrastructure to allow full Internet access. Transforming p-journals into electronic forms with multimedia qualities can cause accessibility difficulties in underdeveloped countries. The following section describes an implementation of e-journal in light of the framework described above.

The Case of the Communications of AIS

The Communications of AIS, a new e-journal to begin in 1999, expands beyond limitations inherent in p-journals. The eight M framework for this e-journal is:

- *Material* The journal focuses on serving the IS teaching community by providing quality articles (such as tutorials, cases, and opinion) that are generally not published in p-journals.
- *Medium* Articles will be published electronically both on Internet and CD-ROM. As multimedia improvements become available, the journal will incorporate them. Authors must consider reproduction limitations and limited Internet access in developed and underdeveloped countries.
- *Means.* A permanent AIS server will archive published articles. Subscribers will receive articles over the Internet for downloading and printing.
- *Mode.* Initially, articles will be in English. Eventually articles maybe written in any language with an extended summary in English. Articles may contain audio, and video.
- *Market.* Communications of AIS is expected to reach 1000 subscribers globally.
- *Money.* AIS members have the option of receiving this or a companion journal as a benefit of membership. Non-members and libraries subscribe.
- *Management.* Articles are referenced by year, article and version number, providing a conventional look and feel. Articles are published when ready. Papers can be modified through version control. The date an article is received and the date posted are shown for priority claims. A yearly CD-ROM and the electronic archive provide permanent copies. Authors must format articles based on strict specifications to maintain the look and feel of a p-journal.
- *Mannerism.* To establish high quality ratings for the journal, articles are being solicited from leaders in IS. Thus, junior contributors can indicate that people of top reputation publish in this journal. In addition, a continuing campaign will be undertaken to inform tenure committees of the journal and its quality control measures.

Conclusions

AEP is a complex undertaking that requires not only advanced technology but also attention to factors such as management of academic publishing, economics of electronic publishing, and the social aspects that are part of the academic society. The success and the future of e-journals depends on the availability of appropriate technology, the journal's ability to survive economically, and the journal's perceived quality, it acceptance, its global accessibility, and its sustainability.

References

References are available from the authors (Anat.hovav@cgu.edu; Paul.gray@cgu.edu).