

MANAGING ACADEMIC ELECTRONIC PUBLISHING: SIX CASE STUDIES

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ABSTRACT

Academic publishing faces major challenges such as increasing costs and a reduced subscription base. Electronic publishing promises benefits and solutions to these and other challenges. This study examines six cases of academic electronic journals and the management practices used by their editorial boards. The cases indicate that many of the anticipated benefits of e-journals can be achieved given structured management practices. However, electronic publishing presents several previously unknown challenges some of which can be resolved by individual journals but others, which we term Universal Issues, require new academic structures and a globally agreed upon set of policies. The case studies reported in this article are part of a larger study that interprets the cases in terms of an 8-M framework developed by the first author.

1. INTRODUCTION

Although examples of electronic academic publishing go back to the 1970's (Turoff 1978, Turoff and Hiltz 1982), electronic journals did not proliferate until the 1990's when the widespread use of the World Wide Web made electronic publication relatively simple. Much of the existing literature is speculative in nature and deals with e-publishing impact on copyrights (Kahin 1996), Refereeing (Harnad 1996), publishers (Fisher 1996), university Presses (Freeman 1996) and libraries (Okerson 1996). Additional literature deals with the economic benefits of e-publishing (Odlyzko 1997, Regier 1997, Hitchcock et. al 1996, Gold 1994). In addition there is a large body of work on digital documents (Brown and Duguid 1994; Wakayama et. al 1998). However, academic journals are, by their nature, a unique genre in the world of publishing (Peek 1997) and thus merit study as a singular phenomenon within the publishing industry.

Table 1 lists the anticipated benefits from e-journals found in the literature.

Accessibility	Any time, any place
Added space	Long articles including programs, data, and more
Interaction	Create dynamic communications rather than archives
New content	Non-traditional research and innovation supported
New formats	Hyperlinks, audio, video enriched information
Reduced cost	Paper eliminated, no postage or storage costs
Shorter cycle time	Near zero lag time resulting from instant reviews and elimination of print and mail time

Table 1: Anticipated Benefits¹ of E-journals

Electronic publishing also introduces new challenges. Some of these challenges were known for a long time, others were discovered during our work (denoted by an *). Table 2 lists these challenges

Backward integration*	Digital technologies change over time. Today's HTML will be replaced by new languages
Chain of citations*	Because articles can be changed, the chain of citations can be broken
Copyrights	Protection more difficult because copying is easier
Fee structure	Perception that internet information is free makes charging for e-journals difficult. Yet, many e-journals do not have a stable source of incoming funds
Perceived Quality	View that Internet is 'graffiti board' and lacks controls reduces quality perception
Editorial Succession*	Some e-journals are run by entrepreneurial editors. Their long term survival depends on the ability to find appropriate successors
Sustainability*	No public archive, such as the Library of Congress, exists to ensure long-term sustainability

Table 2: Challenges Facing E-journals

Even though the foregoing benefits and challenges are assumed true in general, little is known about the implementation practices of e-journals. Therefore, case studies were undertaken of six existing electronic journals to determine what individual journals actually do.

1 The assumption in this article is that printed journals (i.e., p-journals), having a long history, are considered the current standard in academic publishing. For an innovation to diffuse it has to be at least as good as the current standard if not better. Therefore, it is appropriate for this article to examine the benefits and challenges of e-journals in relation to p-journals. Once the challenges and issues of academic e-journals are understood, future studies of various implementations and their success are feasible.

2. METHODOLOGY

The methodology selected is a multiple case design with a single unit of analysis for each case, also called type 3 case study methodology (Yin 1994). The information for each case was collected based on the 8-M framework described in Hovav and Gray (1998) and depicted in Figure 1.

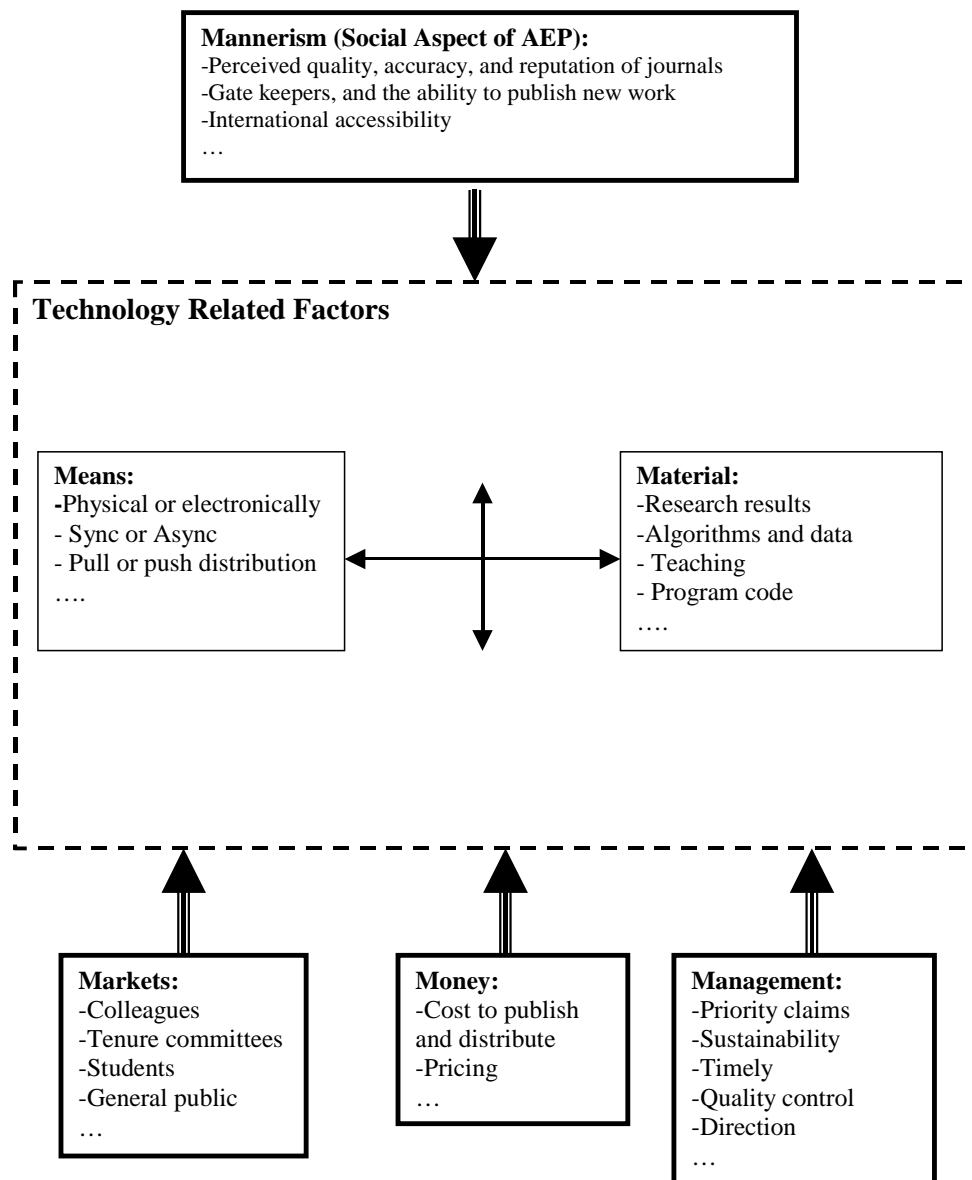


Figure 1. Academic electronic publishing framework
Adapted from Eisenhart (1994)

2.1 Sample

The term electronic journals (e-journals) in this article refers to academic journals using computer-based networks (such as the Internet) as their primary distribution channel. These e-journals may have additional means of distribution (such as CD-ROM) or use multiple media (such as both electronic and paper editions). Hitchcock et. al. (1997) found that e-journals are sponsored and managed by three main sources:

1. Commercial publishers
2. Professional societies and academic associations, and
3. Individual entities (departments, groups of researchers) and entrepreneurial endeavors

The six e-journals were selected to represent the three different sources postulated by Hitchcock et. al. and a fourth group which we found, the government. Table 3 shows the journals studied, their sources and their affiliations.

Journal Name	Abbreviation	Sources	Sponsorship
<i>Journal of Information Law and Technology</i>	JILT	Governmental program	The Electronic Library Program of the Joint IS Committee in the UK
<i>Communications of the Association of IS</i>	CAIS	Professional society	Association for Information Systems
<i>Foundations of IS</i>	FIS	Entrepreneurial	Individuals
<i>Information Systems Frontiers</i>	ISF	Commercial publisher	A paper journal published by Kluwer with electronic presence
<i>Journal of Electronic Publishing</i>	JEP	Commercial publisher	UM Press, but managed by an entrepreneur
<i>MISQ Discovery</i>	MISQD	Professional society + entrepreneurial	ISWorld2 a virtual professional society

Table 3: The Six E-Journal Studied

2.2 Data Collection

The editor was the primary subject. If needed, the editor referred some of the questions to associate editors, secretarial staff, or technical staff. In addition, for triangulation (Yin 1994; Eisenhardt 1989) each e-journal's web site, mission statements and other support documents were examined.

The following was the protocol for data collection:

1. Each respondent was contacted and asked to participate in the study.
2. Upon agreeing to participate, an initial set of questions was sent to the editor(s) electronically.
3. Each e-journal's mission statement, web-site, and any publicly available documents were studied
4. A follow-up phone interview was conducted with the editor(s)
5. If necessary follow up telephone interviews were conducted with additional staff such as an associate editors, secretarial staff, or technical staff.
6. Additional persons involved with the e-journal, such as authors, were interviewed

2ISWorld is a listserv that researches approximately 2000 IS academics and professionals. It is a standard medium used for IS related notifications for people in the field.

Table 4 summarizes the six cases studied. The first column lists the elements of the 8-M framework. Detailed narratives of JILT, a European e-journal are presented in section 3. CAIS, a USA based e-journal is described in Section 4. Highlights of the remaining four cases are presented in Section 5.

Factor	CASE					
	JILT	CAIS	FIS	ISF	JEP	MISQD
Material	Mixed: research and practice	Non traditional work	Philosophical work	Academic and industry research work	Mixed: research and practice	Research papers
Medium	Internet	Internet + CD-ROM	Internet	Co-existence	Internet	Internet
Means of distribution	Pull	Push (notices) + pull	Pull	Push	Push (notices) + pull	Pull
Mode (Audio, video)	Text + images + hyperlinks	All accepted	Text + images	Text + images	Text + images + hyperlinks	Advanced modes
Market	IT law, international	Membership of AIS	Specialized market	Unknown	Library sciences	ISWorld + unknown
Money:						
- Cost to produce e-journals	\$25,000 a year	Minimal, voluntary	Minimal, Voluntary	\$200,000 per year, but not an e-journal	Volunteer work + \$1100 a year	Volunteer work + \$1700 a year
- Fees charged for e-journals	Free	Bundled with membership fees. Institutional - \$95/ year	Free	Individual -\$60 Institutional - \$308 - \$360	Free	Free
Management						
- Direction	High quality e-journal	Content innovation in IS	Niche, focused	Niche, focused	Niche, focused	Pushing the technological envelope
- Sustainability	No provisions	CD-ROM	Paper copies	Library of Congress	No provisions	No provisions
- Timeliness	Average = 2 months	Average = 4 months	1 year	1 year –paper 6 months - online	Average = 2 months	1 year
- Reputation	Via Electronic Libraries Program	Via AIS	Via editors	Via Kluwer	Via UM Press	Via MISQ
- Marketability	Library program, conferences, cyberspace	Via AIS	A specialized community, conferences	Via Kluwer	UM press and member list	ISWorld, MISQ
- Accessibility	Global, any time any place	Limited to AIS members	Global, any time any place	Limited to subscribers only	Global, any time any place	Limited by technology
- Copyrights	Remain with the author ³	AIS	Remain with the author	Owned by Kluwer	Remain with the author	Remain with the author
- Citation analysis	Static articles, using URL	Version control, using year, vol., number	Static articles, using URL	Traditional	Static articles, using URL	Via MISQ
Mannerism:						
- Perceived quality	Via Electronic Libraries Program	Via AIS	Difficult to manage, no strong affiliations	Managed via Kluwer	UM Press, topic itself	Via MISQ
- Look & Feel	Paper like	Varies by articles	Paper like	Paper	Paper like	Innovative

3 JILT authors have partial copyrights. They are allowed to republish their work in paper journals but are not allowed to post their work in any other electronic form (such as another e-journal or a Web site).

- Gatekeepers	No information available	Allows to bypass	Specialized, committed to the topic	Multi-disciplinary. Industry and academic	Specialized, committed to the topic	Same as MISQ
- T&P	No active campaign. No tenure issue in Europe	Active campaign	No active campaign, less of a concern	Managed via Kluwer	No active campaign, less of a concern	Based on MISQ
- Globalization	Increasing (based on readership survey)	CD-ROM; Place complex modes in appendices	Increases due to low "electronicity"	Increase for universities that can afford the online access	Increases due to low "electronicity"	No provisions taken

Table 4: Summary of the Cases

3. JILT – JOURNAL OF INFORMATION LAW AND TECHNOLOGY

JILT published its first issue in January 1996. The journal was started as a result of a governmental program initiative in the UK to promote digital libraries and e-journals.

JILT’s objectives are to promote communication and debate among its constituency, reduce publication cycle time, provide users with links to primary and secondary sources and provide an example of a high quality e-journal in law and technology.

JILT maintains a conservative image. Its articles use little of the "electronicity" available to e-journals. They are sequential and look much like paper articles. Articles are published in three yearly issues. When an issue is posted, a notification message is sent out to JILT membership. The structure of the articles allows easy access regardless of the level of technology used.

JILT publishes a large range of material such as refereed articles, applications, conference reviews, book reviews, discussions, consulting documents and legislation reports. As of August 1999, JILT published a total of 240 pieces of work. The material published covers areas such as IT Law, IT applications in legal practice, software reviews and demos, legal issues in electronic commerce, security and privacy issues, liability for defective software, practical and legal barriers to electronic access, and computer crimes. JILT is designed primarily for legal academics but also considers legal practitioners, government and business institutes. JILT is the only e-journal studied that collected, analyzed and published market information.

JILT was initially funded by the Electronic Libraries Program, which was established by the Joint Information Systems Committee in the UK. The initial commitment was for three years. To ensure continuation, the initial financial plan was to offer JILT as a subscription-based e-journal. The plan also suggested a pay-as-you-use plan for individual users. This business plan recognized the possibility that at the end of three years, the e-journal will still require external funding. In 1997/1998, the plan was revised based on evidence that Internet users are reluctant to pay subscription fees for e-journals. There was also evidence that pay-as-you-use strategies may not be very successful. The revised plan included support from commercial publishers, commercial companies (legal and other) and additional research funding. The plan also introduced the possibility of using advertisement as a financial resource.

Currently, JILT is free both to individual readers and to libraries. The costs associated with the production and distribution of JILT are estimated at \$25,000 a year. As of Aug 1999, the journal was still funded by the Electronic Libraries Program and by a small grant from CTI Law Technology Center. The length of the commitment is unclear. It is also not clear how will JILT support itself in the future. Yet, JILT did not establish measures to ensure long-term sustainability of the published material.

JILT is marketed internationally via professional associations, active mailing lists, news groups and conferences. In cyberspace, JILT can be found using Internet-based search agents.

The mean cycle time from submission to publication is approximately two months. The time spent on the review process is approximately three weeks. To achieve a quick and efficient review process, the process is

completely electronic and referees are enabled to enter into anonymous communication with the authors. In addition, stand-by referees are available when original referees are unable to complete the review in a timely manner. Occasionally, JILT posts news and breaking stories as they appear. However, the site does not have any special indication that distinguishes or highlights these new postings nor is there a notification mechanism in place.

JILT editors successfully manage two conflicting goals; The publication of rigorous refereed articles versus relevant applications and legal cases. In order to create a hybrid product, the table of contents is designed to allow easy access to both interest groups. The articles are divided based on the type of material they represent.

JILT uses an automated link checking software to ensure that a high percentage of the external links are resolved thus increasing trust in the quality of the material published. In addition JILT maintains an active marketing campaign to improve its perceived image (i.e. awards, readership surveys).

JILT was established to support a hybrid market: academic and practical. With the support of the Electronic Libraries Program, a highly reputable editorial board, a rigorous refereeing process and an automatic link checking software, JILT does not face major obstacles in its attempts to establish a reputation, a positive perceived quality, market share and international recognition. Yet, JILT's financial status and long term sustainability are questionable due to the limited nature of its current financial support.

4. CAIS – COMMUNICATIONS OF AIS

The Communications of the Association for Information Systems (CAIS) is a pure electronic journal that began publication in January 1999. It is sponsored by the Association for Information Systems (AIS).

When the Council of AIS considered creating journals for its membership, they concluded that, as an information systems professional organization, they should use the technology in which its members are expert. The council also saw the opportunity for creating a journal that expands beyond the limitations inherent in p-journals. The goal was to create a journal that served different needs than those of a conventional research journal. CAIS includes opinion papers, case studies, tutorials and research and teaching methodologies as well as research papers.

Work is posted when ready thus reducing the mean cycle time to approximately 4 months. By reducing the publication cycle time and by soliciting comments on published articles, CAIS supports communications among scholars. A monthly announcement is sent to CAIS target market of over 2000 readers. Current work is published on the Web in two formats: HTML and PDF. Archival work is published on a yearly CD-ROM. The mixed media approach increases accessibility both in developed and underdeveloped countries and ensures long-term sustainability of the published material. CAIS utilizes the "electronicity" of the Internet. For example, see Hars (2000).

CAIS is a subscription-based e-journal and is "bundled" with AIS dues. Site licenses are sold to Universities at a nominal rate of \$95 a year, that allow anyone (particularly students) at that institution to access the journal from the university's computer.

CAIS, being a publication of a professional society, is a journal of record. Thus, it maintains an archive of what has been published. The journal is marketed through the AIS business office. With a membership of over two thousand, the journal has a built-in circulation. However, like all new journals, CAIS has had to wait two years before it can be indexed or abstracted by national and international services.

CAIS manages its reputation by appointing an elite editorial board, active involvement of the associate editors and a large number of articles written by well-established and highly reputable authors.

To increase its perceived quality and acceptance CAIS (1) follows a general outline of a traditional journal. Articles are referenced by year, article and version number rather than using a URL. (2) adopted an active program to increase acceptance by tenure committees. The program includes a continuing campaign of

letters by the President of AIS informing tenure-committees of the journal and its quality control measures. (3) articles may be printed and submitted to tenure committees' review in a format resembling paper articles.

5. FIS, JEP, ISF AND MISQD

This section presents highlights and unique features of the remaining four e-journals studied.

FIS was established by a grass-root movement within Information Systems. It operates on a small budget, by entrepreneurial editors. Its long term survival depends on research grants, continued interest by its current constituency and the availability of future editors. FIS is an example that e-publishing can afford the initiation of a new academic journal with minimal out-of-pocket expenses. Thus, allowing a relatively small group of academicians to create an outlet that supports a unique and non-traditional research stream.

ISF is a newly founded paper journal with electronic presence. It is managed by Kluwer Academic Publishing which publishes over 400 academic journals. Thus, ISF represents current management practices in academic publishing such as extensive marketing and sales efforts⁴. The long term sustainability of the published material is secured via the Library of Congress. ISF was established as a p-journal to ensure increased perceived quality and acceptance.

JEP is an e-journal published by University of Michigan Press. It is managed by an entrepreneur. The journal was establish as a service to the community and as a working example. Its target audience is practitioners of academic publishing and library scientists. The survival of the journal is unclear and depends on continued financial support by UM Press, the availability of publishable material and the continuous availability of an appropriate editor. JEP does not employ extensive management practices such as long term sustainability of the published material, marketing campaigns, notifications to T&P committees or the inclusion of articles in secondary indexing services.

The goal of MISQ Discovery is to push forward with technology and rely on the reputation of MISQ for acceptance and perceived quality. The journal requires both rigorous theoretical and research content and extensive use of the technology. This combination reduces the number of qualified articles. MISQ Discovery uses living scholarship⁵ to increase interactivity and relevance. After over four years of operation, the founding editor of MISQ Discovery concluded that such ventures as the introduction of an e-journal should be done incrementally.

6. DISCUSSION

Our studies examined both the anticipated benefits and the challenges to the six e-journals. We also found

- some issues that we named 'universal' because they were larger than could be solved by an individual journal alone (Section 6.1)
- some unintended consequences of e-publishing. (Section 6.2)

Table 5 examines the extent to which the anticipated benefits are achieved by the six e-journals.

⁴ Tenure committees are appraised of the existence and the mission of ISF, as any other traditional journal published by Kluwer Academic Publishing.

⁵ One of the unique features of MISQ Discovery is the "living scholarship". Articles are posted in two places. The archival version is housed on a MISQ Discovery server and can not be changed in an ad-hoc manner. The "living" version remains with the authors and can be changed at the authors discretion. "Living scholarship" work is discussed on the ISWORLD listserv, increasing interactivity and communications among IS researchers.

Anticipated Benefit	Actual Benefits
Accessibility	Most e-journals can be read 24/7 in .html with conventional modems. However, because MISQD uses high levels of "electronicity", it limits access to high-speed networks. To ameliorate this problem, CAIS issues a yearly CD-ROM.
Added space	Most e-journals (CAIS, JILT, MISQD) use the added space to allow new and innovative material.
Interaction	E-journals did not increase interactivity. Most authors interviewed did not receive more comments on the work they published in an e-journal than in p-journals.
New content	FIS is an example of an E-journals that publishes unorthodox work. The relatively low cost to initiate an e-journal allow grass root groups to create their own publication outlets.
New formats	Most e-journals do not use the medium to increase "electronicity". Articles in FIS, JEP and JILT have the same look and feel as articles in traditional p-journals to increase acceptance and reduce download time
Reduced cost	Much of the cost is supported by external entities (associations, p-journals, research funds and commercial publishers). E-journals are not expense free. Much of the work is voluntary and the costs are hidden. Packaging and distribution costs are reduced. Some costs shift to the reader(e.g., printing of articles), the editor(s) and the university. E-journals like JILT, JEP and FIS have short term or uncertain financial arrangements, reducing their long term sustainability.
Shorter cycle time	Some e-journals publish periodically to increase acceptance. Fully refereed journals (MISQD, FIS), experience the same delay as paper journals. The key to a reduced cycle time in refereed e-journals is to re-engineer the review process (JILT).

Table 5: Achievement of Anticipated Benefits

Table 6 shows the approaches taken by the six e-journals in managing the challenges.

Factors	Current Practices
Back Backward integration	Nnof None of the e-journals provide for backward integration. E-journals such as FIS and ISF that are less dependent on the technology can be converted with less efforts than MISQD which uses the Web extensively. This is an open issue that needs to be studied further.
Chain of citations	Currently all e-journals are static. None of the journals implemented scholarly skywriting (Harnad 1996). MISQD uses living scholarship. However, only the archival version should be used for citation and references. JEP and CAIS use versioning control.
Copyrights	Policies are mixed. CAIS maintain the copyrights to the articles but allows free copies to be made for educational purposes. JEP allow the rights to remain with the author.
Fee structure	The current fee structure of most e-journals is free to the readers. CAIS requires membership in AIS but charges libraries. JEP has a subscription list but joining is free. MISQ Discover, FIS, JEP and JILT are free. JILT attempted to charge library fees and pay-per-view fees with limited success. Considering the potential financial instability of most e-journals (Hitchcock 1996), some fee structure will have to be implemented. This is also an open issue.
Perceived quality	Managing the perceived quality of e-journals is problematic. Most are managed by volunteers and amateur editors. With the exception of CAIS and ISF, the e-journals studied lack active marketing and promotional efforts to tenure committees. All manage their perceived quality based on a highly reputable editorial board and high quality articles. MISQ Discover, JEP, CAIS manage their perceived quality via an affiliation with an existing organization structure. JILT manages its perceived quality via its association to the Electronic Library Program of the UK government. FIS, a grass root e-journal, has a more difficult task managing its perceived quality. In general, e-journals do not enjoy the same prestige that p-journals do.
Succession	Only CAIS, ISF and MISQD have formal succession policies. E-journals such as JEP and FIS that depend on an entrepreneurial editor will have more difficult time ensuring a qualified successor.
Sustainability of the published material	With the exception of CAIS, the e-journals studied do not provide for long-term sustainability of their material. E-journals such as FIS and JEP which can be easily replicated in paper may use traditional repositories. E-journals such as MISQ Discovery that use high levels of "electronicity" and external links need a different form of long-term repository. Considering that some of the journals have short term and uncertain financial backing, this lack should be of universal concern.

Table 6: Managing the Challenges

6.1 Universal Issues

Several of the challenges described in Table 6 can not be solved by an individual e-journal. The cost to implement (e.g. backwards integration) or their scope (e.g. sustainability) require global changes to the way academia publishes articles.

1. *The reliability of the infrastructure:* Currently paper, a reliable medium, is the basic infrastructure to deliver and share knowledge. A filed paper copy of an article is always available and accessible. The Internet is not yet reliable. Some sites are unavailable, links are unresolved, and images are inaccessible. JILT, for example uses an automatic search program to find broken links, report them, and display an appropriate message. However, this only solves part of the reliability problem.
2. *Backward integration:* Most information technology is only supported for 5-7 years. E-articles that are created using a given technology need periodic conversion or continuous support. For example, material saved five to ten years ago on 5 1/4 inch diskette is no longer readily accessible.
3. *Long term sustainability:* Paper copies of articles are sustained via the Library of Congress. Currently, there is no similar repository for e-articles. When e-journals cease publication, their published work expires with them. Articles that resemble p-articles are easier to sustain. Centralized articles that use high levels of "electronicity" can be archived on CD-ROM assuming resolution of the backwards integration issue. However, distributed articles (i.e. articles that reside on various machines) can not be easily archived.

6.2 Unintended Consequences

The implementation of universal academic electronic publishing creates a set of unintended consequences:

1. Some stakeholders, specifically universities in underdeveloped countries and less affluent universities in developed countries, are forced into use of e-journals without being part of the decision making process.
2. Whereas in the print world everyone has paper, in the electronic world the available technology is highly variable. This variability can create a class system within academia. Scholars at some institutions are able to access highly complex e-articles while others can only access simple forms of e-journals, thus losing some of the knowledge.
3. The use of multiple modes creates a new set of review and tenure and promotion guidelines. These guidelines go beyond content and add considerations such as format, use of media, and level of complexity. For example, articles published in MISQD stand the theoretical rigor test as well as being highly electronic.
4. The workload for authors increases. To introduce increasing levels of "electronicity" in their articles, authors construct articles with multiple levels of mode and content complexity, and they have to maintain these articles as long the articles are "active." MISQ Discovery with its living scholarship is an example.

7. CONCLUSIONS

The journals studied lead to the conclusion that, managed properly, e-journals can achieve many of the anticipated benefits (Table 5). For example, FIS and JEP created additional publication outlets for research that would not have been possible otherwise. CAIS provides opportunities to publish innovative types of work (content related) that were not being published previously. JILT brings together academic rigor and practical relevance. Both CAIS and JILT increase the ability to publish relevant information by reducing the publication cycle time. MISQD and CAIS Increase the richness of the material published by using the "electronicity" afforded by the Internet. JEP and FIS Allow editors to improve promising manuscripts rather

than reject them at the on-set. All six journals are accessible at any time and from any Internet connected computer.

The case studies also indicate difficulties that current e-journals can encounter and that editors of e-journals should prepare and plan for. For example:

1. Some e-journals are run by entrepreneurs. Unless succeeding editors are available and are also entrepreneurial, the long-term survival of these e-journals is questionable (e.g., FIS, JEP). Succeeding editors need the same vision and enthusiasm as the founding editor(s). If they do not, the e-journal will wither (e.g., MISQD). It is important for entrepreneurial editors and journal sponsors to develop a succession plan to ensure continuation of the e-journal.
2. E-journals that are supported by temporary financial arrangements (e.g., JILT, JEP) should establish and make public a financial business plan much like other ventures do. E-journals that cannot promise long-term economic survival should be considered experimental.
3. Some e-journals are managed by a volunteer staff that does not have the time, the budget, or the knowledge to institute proper administrative procedures and policies. To increase acceptance and perceived quality of their e-journals, editors should institute:
 - A marketing plan
 - A plan for continuing sources of input material
 - An active campaign to inform Tenure and Promotion committees of the e-journal existence
 - A secondary indexing as soon as the e-journal is eligible

E-journals also introduce a set of universal issues (e.g., backwards integration, long-term sustainability and network reliability) and unintended consequences. These issues need to be resolved by creating new over-all policies and by changes in the academic publishing process. Editors should consider these issues in the implementation of e-journals. For example, implementation of living scholarship may not be viable until sustainability of distributed articles is resolved.

The long-term future of academic e-journals is uncertain. It can range from near disappearance to full acceptance and implementation. Table 5 indicates that e-journals can resolve many of the issues facing p-journals. However, AEP's future depends on the resolution of the issues discussed in Table 6 and the universal issues discussed in section 6.1. Some of the challenges can be resolved by individual e-journals while others require new academic structures and policies.

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