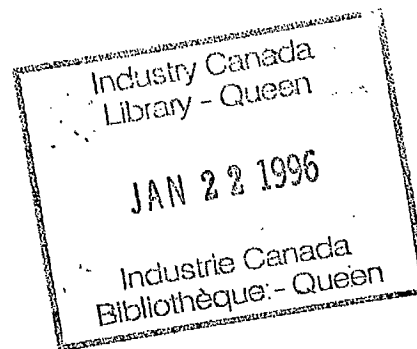


**Cost and Revenue Structure of Academic Journals:
Paper-based versus E-journals**

by

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Cost and Revenue Structure of Academic Journals: Paper-based versus E-journals

Executive Summary

This report provides a cost-benefit analysis of publishing academic electronic journals (E-journals) relative to that of publishing traditional paper-based journals in the Social Sciences and Humanities in Canada. The analysis includes implications for relative revenues as well as costs. This is based on four sources: a thorough review of the pertinent literature, a representative sample of Canadian peer-reviewed academic journals in the Social Sciences and Humanities, costs of publishing a journal based on cost estimates available from a sample of commercial printers, and estimates provided by some experts in the E-journal field. The report also presents a variety of issues that go beyond the formal cost-benefit analysis, such as the emerging role of libraries in the electronic age. These issues will have an impact on the ultimate acceptance of E-journals by the academic community.

Also important to our analysis was an appreciation of the technological changes in the electronic media and its impact on the costs of publishing an E-journal, as well as the environment distinctive to academic publishing.

Our analysis indicates that the costs of producing and distributing a new E-journal can be 28 to 48 percent lower than that of its paper-based counterpart. This does not include savings accruing to on-line peer review and submissions, since this is possible regardless of output format. Our estimated savings, however, can be offset almost completely by a reduction in subscription revenues. This is especially important for an existing paper-based journal considering switching to an electronic format. In either case, the net loser will be the commercial printers, whose revenues will disappear. In the absence of a revenue stream from subscribers, E-journals will continue to require support for their operations. This support would be a trade-off between the supporting associations and subscribers of paper-based journals (who essentially pay for the printing expenses) and the funding agencies (who fund the rest of the expenses).

From an overall perspective, improving the cost-revenue structure of publishing a journal in the Social Sciences and Humanities may require two initiatives. The first initiative would be to reduce the 'first copy' costs by improved training and by encouraging the use of electronic media for the editorial process. The second initiative would be to investigate the potential for economies of scale by providing technical services from a centralized location to all E-journals. This centralized location would essentially serve as a commercial electronic printer and manage all the technical aspects of electronic publishing for all journals. If this is made possible, there could be a significant reduction in the overall costs of publishing an E-journal.

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Cost and Revenue Structure of Academic Journals: Paper-based versus E-journals

1.0 Introduction

Industry Canada is considering proposals to encourage the development of on-line, peer reviewed journals, whether by the establishment of new journals or by the conversion of existing paper-based journals to an electronic form. One of the difficult issues is that of costs and revenues - whether an on-line journal is less expensive to publish and distribute than its paper-based counterpart and whether an on-line journal (E-journal, hereafter) can maintain subscription revenues.

The purpose of this report is to conduct a cost-benefit analysis of on-line (electronic) journals relative to the traditional paper-based journals. The exact terms of reference for the work are outlined in Appendix A. As will be seen later, other considerations besides direct cost-benefit issues have both direct and indirect impacts on relative comparisons. These issues are also reviewed briefly in this report to provide an overall view of the subject.

The report is based on work conducted in five steps: an extensive literature review of the subject area; analysis of advances in the technology of publishing (and distributing) an E-journal; an analysis of the cost-revenue structure of a sample of paper-based Canadian journals; and its comparison to that of the E-journals; and finally a cost comparison of paper-based and E-journals based on the information produced by the first four steps.

Accordingly, the report is organised as follows: the next section provides a brief review of the pertinent literature, followed by a section on technological issues. This is followed by the description of the methodology used to determine the sample of journals used in this study

and to analyze their costs and revenue structure. The report ends with summary and conclusions.

2.0 Literature Review

2.1 Introduction

There were three objectives for this phase: to review the evolution of the debate on the relative merits of paper-based and E-journals; to identify previous studies, if any, on the relative cost-revenue structure; and to identify any future trends that may have significant impact on the relative cost-revenue structure.

Appendix B provides a list of journals and conference proceedings from which over 100 articles were collected. At the very beginning of this project it became apparent that the pre-1990 papers would have little relevance to the project due to the significant changes that have occurred in the electronic publishing environment since that date. Thus, only two pre-1990 papers were considered relevant to the project.ⁱ This review is thus based mainly on the articles from the post-1990 period.

It may not come as a surprise that many of the journals are from the library science area. This is simply because of the fact that library resources have been under tremendous pressure in the 1990s, at the same time the costs and the number of paper-based journals have increased significantly. Thus, there is a vigorous debate amongst librarians on the potential impact of E-journals on their budgets and costs. Since this literature is rather formidable, only an overall review is provided here. Our review concentrates on those issues that have direct implications for the relative merits of E-journals vis-a-vis their paper-based counterparts. It also includes conclusions drawn from some of these papers.

The literature review suggests a variety of issues that are relevant in the assessment of relative costs and benefits of E-journals and paper-based journals. These include: the impact on libraries in terms of their budgets, issues concerning the personnel, equipment and training; indexing issues; the impact of E-journals on how academics use and process information; some anecdotal comments about how many academics still view paper-based journals as being of better quality than E-journals; copyright issues in the electronic world; future trends impacting the technology of electronic publishing; and the impact of such new initiatives as the Faculty Electronic Research Center (FERC), the Red Sage project, and the Stelar experiment.ⁱⁱ There are also some papers which deal with the relative costs of E-journals; however, many of these papers are concerned with the pre-Internet, pre-HTML, pre-Mosaic, pre-World Wide Web (WWW) world. This limits their relevance to the cost-benefit debate but they do provide some insights on other issues. It should also be noted that although most of the studies have a U.S. context, they do have some applicability to the Canadian situation as well.

Overall, the literature review indicates a rich source of information about the pros and cons of the relative merits of paper-based versus E-journals, though not necessarily related to the costs of producing and distributing the two types of journals. Some of the issues are philosophical and deal with free access to academic material, while others investigate the impact of this potential transformation on library budgets. Although these issues do not fall under the mandate of this study, these are important enough to be considered in the overall debate. The following list provides further elaboration of some of these issues (in point form) with additional comments as considered necessary.

2.2. Issues surrounding E-journals versus Paper-based Journals

Library acquisition, storage and maintenance costs:

Institutions cannot continue to provide funding to maintain current collection levels, let alone deal with the proliferation of new journals. The assumption is that these costs will diminish with the advent of E-journals.

Speed of publishing:

Paper-based journals take a long time to publish, whereas E-journals can publish individual papers quickly, which then can be grouped into a volume. Subject-specific collections of single articles can also be published (made available) on demand.

Advertising revenues:

These may decrease unless innovative ways can be found to maintain them. For example, it is possible that with every paper that is downloaded, an advertisement page will be attached automatically. If this is considered as appropriate by the editor/association, then advertising revenues may actually increase as advertisers would have a guaranteed avenue for exposure; all articles printed (or viewed on the monitor) would have an embedded advertisement which will be noticed by the reader.

Copyright issues:

This issue has received a lot of attention. However, some have claimed that most authors are more interested in publishing than in receiving royalties, since they want to have their work published to gain promotion, salary increase and recognition. For most of them, the rewards for publishing come from recognition and not from receiving royalties. If that is indeed the case, then copyright for an academic E-journal may not be a significant issue. If, on the other hand, commercial publishers (of non-academic or professional journals or magazines) are concerned about receiving royalties, then arrangements will have to be made to allow them to be adequately compensated without imposing a cumbersome time-consuming system

of specific permissions. For example, this can it be handled simply by instituting a flat site license fee depending upon the number of subscribers per institution.

Costs at the user level (computer equipment, access to a laser printer):

Since E-journals require the user to print the desired article, the costs of this task are essentially borne by the user. If this requires that the user either buy the necessary equipment or that the University library provide it to her at a cost, then these costs should be somehow accounted for in a full cost-benefit analysis. However, it is highly likely that researchers in most institutions already have access to good quality equipment . If so, these incremental costs may be negligible. It is also possible that many will store the desired articles on their machines (hard disk), read the electronic version when necessary, and choose only the most relevant pages or paragraphs for printing. In this case, incremental costs at the reader site may not be significant.

Technical knowledge of the user group:

E-journal transformation may require that all users (especially those who do not have an adequate technical background) acquire additional training, thereby increasing overall start-up costs.

The sociological challenge:

Creating a credible channel for the dissemination of knowledge so that there is no perceived difference in quality. This may imply that a new E-journal will incur higher marketing costs in order to convey to the academic community of its quality, the rigour of its review process, and its relevance.

Method of distribution:

There are a variety of ways a paper-based journal can be transformed into an E-journal. These include a simple notification by E-mail, sending the table of contents electronically or in print form; individual printing; library printing; library printing and

binding; mailing electronically only after receiving a request and charging for the mailing, and so on. The technological challenge of finding a way to package the E-journal so that readers will find it workable and attractive is also very relevant. Most of the early E-journals required readers to download a text-only journal and print out the articles they wish to read. It was like having a poor second cousin of the paper-based journals. But new advances in technology imply hypertext linkages and an enhanced 'cut and paste' or linked references potential. These advances in technology now make it much easier to disseminate a paper electronically. If users find that technological barriers exist to downloading and printing journals by themselves, it is possible that licensing and printing arrangements with institutional libraries (publicly-funded or private/corporate funded) can be established for printing requested articles as well as for providing archiving and other centralised services for all journals.

Other benefits of E-journals:

These include speed of dissemination, ease of individual and mass use, and potential for electronically linking references for more efficient retrieval.

Relative Quality:

Some resistance will be found in converting a paper-based journal to an E-journal due to the perceived quality of existing E-journals. However, it is the quality of the review process that establishes a journal, not how it is distributed (paper or electronically).

This brief summary of the various points raised in the debate concerning paper-based and E-journals indicates that the cost-revenue structure of producing and publishing a journal may not be the only issue which needs to be addressed in a discussion of changing the medium in which academic journals are published and distributed. However, the impact of the ever rising costs of printed material and the continual rapid advances in technology

indicate that the E-journal is already providing serious competition to the paper-based journal on a variety of fronts.

2.3 Technological Changes

Probably the most important component impacting on this debate is the rapid advance of technology, which continues to reduce the costs of electronic publishing and of learning the new technology. These advances now allow an E-journal to efficiently include equations, graphics, and figures. For example, The Electronic Journal of Combinatorics is a very good example of the usage of the latest technology for publishing an E-journal as of 1994.ⁱⁱⁱ Appendix C provides a 'cut and paste' sample of its information screen. Since WWW and HTML are expected to dominate electronic document management and distribution, a brief review of the word processing filters and the implementation of a WWW site for an E-journal is described in Appendix D.

These two appendices indicate that the technological barriers to publishing an E-journal are fast disappearing, that the ease with which the new software access and browse/search tools can be used is improving, and that the growth of Internet in universities and other institutions has the potential to significantly increase access to E-journals.

3.0 Relative Costs and Revenues of paper-based versus E-based journals

3.1 Introduction

Before attempting to assess the relative costs and revenues of paper-based versus E-journals, it is important to clarify the various cost components typically incurred by these two types of journals. This clarification requires a clear description of the process of producing a typical paper-based journal and its electronic counterpart.

3.2 A typical Process: Paper-based journal - cost-revenue structure

A typical process of publishing a peer-reviewed, paper-based academic journal can be broadly described as a two phase process: the first phase constitutes the 'submission to acceptance' process and the second phase constitutes the 'acceptance to publication' process. In the first phase, an author prepares a manuscript generally on a word processor and sends it to the editor, who, in turn, sends it to referees (two or three) - specialists in the specific subject areas. The referees review the paper and propose its acceptance or rejection, or suggest amendments or corrections to the editor, who then communicates with the author. If the paper is to be accepted upon revision, this process of author to editor to referees, and back to the editor and back to the author, may continue for two or three rounds until either the paper gets accepted or the author gives up. The costs associated with this step are sometimes termed 'first copy' costs.

It should be noted that much of the intellectual process in this 'first copy' phase is relatively inexpensive, as far as out-of-pocket costs are concerned; the writing and peer refereeing is done by scholars who consider this a normal duty of their profession. Some journals require an article submission fee and do provide an honorarium for referees; however, the intent is to ensure discipline and not to generate revenues. Similarly, most of the editorial work, such as soliciting and reviewing manuscripts, is done by individuals without fees. This process is expected to remain the same even if the journal changes from a paper-based journal to an E-journal. The main costs of the 'first copy' phase are to maintain the editorial office and manage the acceptance - subscription - printing process.

The second phase begins once the paper is accepted. In this phase, the editor requests that the author submit the manuscript electronically (along with the hard copy) in a prescribed word processing format. Upon receipt, a copy editor reviews the manuscript for both writing style and consistency.^{iv} When this is completed, the paper waits for the selection of its companion papers to fill a volume (generally, quarterly). The set of papers,

along with the table of contents, is sent to a private sector (commercial) or a University press. Next, the papers get typeset, figures and tables get reformatted to ensure consistency, and galley proofs are sent to the authors for revision (typically at a cost for major revisions). The volume is printed, bound and mailed to individual and institutional subscribers. Extra copies are sent to the editor and authors receive the requested number of reprints (at cost) of their own paper.

The revenues of a paper-based journal are primarily derived from two sources: institutional (library) subscriptions and individual subscribers. In many instances, the individual subscribers are members of the association sponsoring the journal and the journal receipt is automatic; that is, there is no decoupling of journal subscription fee from the membership fee. For individual non-members, the subscription fee is generally higher than for members. As will be seen later, the mix of members and non-members of a journal as well as its ties with the association are important considerations in evaluating the revenue impact of a change to the E-journal format.

Clearly, the smaller the subscription (or circulation), the higher is the percentage of total costs accounted for by the 'first copy' phase. Also, the phase two costs are somewhat smaller for a pure text-based journal and higher for a journal which has equations, figures and graphs due to lower typesetting costs. From a cost-revenue perspective this process can be shown as follows:

	Individual Category	Source
Revenues	subscription income	association membership, individual subscription, mix of members versus non-members, institutional subscriptions
	advertising income	publishers of books etc.
	grants	federal government (SSHRC), private grants,

		association funding
	reprints, back issues etc., author charges	special charges
	hidden subsidies	editorial time, University space, equipment, secretarial support, referee time etc.
Costs	editorial office	honorarium, copy editing, travel, board meetings, etc.
	production	type setting, printing, binding
	distribution	subscription maintenance, postage and mailing
	marketing	institutions, advertisers, other citation/indexing bodies
	operating costs	accounting, storage, admin office, general office expenses

3.3 A typical Process: E-journal - cost-revenue structure

Given this fairly typical description of publishing a paper-based journal, it is important to describe the typical process for an E-journal. Clearly, this is not an easy task since this electronic conversion (or version) may follow a variety of avenues. At one end of the spectrum would be a journal which is completely electronic, that is, the entire process is done electronically (submission, review, acceptance and publication) and every step is handled through the Internet and E-Mail. At the other extreme would be a process where subscribers are simply notified electronically (say via E-Mail) of the arrival of the journal and its table of contents. In this case, no other change in the process is put in place; the journal continues to be produced on paper.

Since the main purpose of this report is to compare the relative costs and revenues of E-journals and paper-based journals, it is important to ensure that a proper comparison benchmark is established. For the purpose of this report, we concentrate on the costs associated with phase 2 of the process. The reason for this choice is the fact that any paper-based journal can today make changes to the 'first copy' phase of the publishing process. It can make this process completely electronic and still continue to publish a paper-based journal in the traditional form. The main difference between an E-journal and a paper-based journal is then in the second phase where there is a radical departure from the tradition. This is where any cost and revenue differential should be noticeable.

As far as the second phase is concerned, there are a variety of methods by which a journal can be made electronic. For example, going electronic can mean having a text-based (ascii) distribution system through FTP or establishing a WWW site with a well-designed home page and using the latest in the Internet world (e.g., Mosaic/Netscape). The developments of the last year or so and the tremendous pace of proliferation of Internet tools implies that any future E-journal would be based on these new tools and technologies. As noted earlier, the description of the technical issues involved in the distribution of E-journal articles and a description of a possible implementation process are to be found in Appendix D.

For the purpose of the comparisons in this report, a true electronic journal is defined as one that exists in electronic format only, rather than a "parallel" version of a print journal. The issue then is the cost associated with publishing and distributing the journal and the revenue impact - the latter quite important in the case of an existing paper-based journal.

Before describing the methodology followed for cost and revenue comparisons between paper-based and E-journals, there are three issues about the costs of E-journals that need additional clarification. The first issue relates to 'first copy' costs versus total costs. Since there may be little difference in the 'first copy' costs between an E-journal and a paper-

based journal assuming that the most cost-effective method is chosen by the editor of the journal, we do not consider this as having any impact on an incremental basis. Second, there are references in the literature to statements by publishers who have converted from paper-based journals to E-journals about large levels of savings in production costs; but there is no reference to the revenue impact. One needs to consider both.

Third, there is a discussion in the literature (Quinn and McMillan in Duranceau, 1995, p. 81) about generating economies of scale on the technical side (systems support, hardware and software costs). These exist if E-journals share the same technical resources. If this is possible or is made possible, then significant additional savings may arise as described later in this report. All these issues must be kept in mind in evaluating the analysis that follows.

3.4 Methodology

To get the necessary information on the cost-revenue structure of paper-based and E-journals required us to develop a representative sample of Canadian peer-reviewed academic journals in the Social Sciences and Humanities. This list was compiled from several sources but relied mainly on the Canadian Sourcebook: 1995. SSHRC provided a listing of journals it supports, but did not provide contacts or further information due to confidentiality requirements.

From this list, a sample of ten journals were asked for their 3-year financial statements; and 6 journals provided these. Of these, five were chosen based on the clarity of their financial statements. These are presented as Journals A, C, D, E and F in order to provide anonymity to the respondent journals. Other pertinent information on these journals is described in Appendix E. Due to the express wishes of the respondents, individual names of the respondents and their journals are not mentioned in the report. Some respondents were reluctant to provide any information unless their condition of

anonymity was respected. This was mainly based on fear that this analysis might be conducted as a prelude to the reduction of their funding levels from SSHRC and from other government agencies. Notwithstanding these difficulties, the five journal sample includes a broad spectrum of highly respected journals in the Social Sciences and Humanities in Canada.

In addition to contacting these journals, we also contacted publishers of academic journals in the private sector and those affiliated with University presses. We also contacted some experts in the field. This was considered necessary in order to understand the revenue and cost components of a typical journal and to reclassify the received financial statements to enable comparisons and generalizations. We were also fortunate in receiving copies of 1993 quotes received by a paper-based journal in its search to find the most efficient publisher for its own publication.

Discovering the "universe" of current electronic journals in Canada was a great challenge. Documentary sources such as the Directory of Electronic Journals, Newsletters and Academic Discussion Lists (ARL) are already out of date. Through a series of contacts, it was discovered that a small team headed by Nancy Brody at the National Library of Canada is currently compiling a Canadian directory of electronic periodicals and archives. The National Library was a great help in tracking down peer reviewed electronic journals, as was Paul Leadwell of the Association of Learned Journals.

Based on these contacts, it seems likely that there are no more than eight to ten peer-reviewed electronic journals in Canada at this time, although the number is growing quickly. We managed to contact the editors/publishers of six of these journals; and five agreed to an in-depth interview (Appendix F). All five mentioned the economic (cost) advantage of an E-journal over its paper-based counterpart. In addition, all noted value-added advantages of using this technology (articles are more timely, linked references

facilitate research, and so on). In terms of cash outlays, most believed that the lack of subscription revenues would be more than offset by cost savings.

It should be noted that the origins of E-journals date back to 1987. Early attempts at establishing E-journals include journals like EJournal, Public-Access Computer Systems Review (PACS), The Electronic Journal of Communications (EJC/REC), Psycholoquy, Postmodern Culture, and New Horizons in Adult Education. The first three were (and are) dedicated to the very subject of the electronic publishing of academic journals. Since then there have been many E-journals, some with excellent print quality including graphics and charts as good as those of any paper-based journal. These journals take advantage of the latest HTML technology and include The Electronic Journal of Combinatorics and the Online Journal of Current Clinical Trials. These two journals are considered the best of today's breed, and are the ones which represent the wave of the future in E-publishing. Thus there is no doubt that technological barriers are fast disappearing, costs of production of an E-journal continue to decrease, and their quality and acceptance in the academic community is on the rise.

4.0 Economic Analysis of Paper-Based Journals

4.1 A Typical Paper-based journal

To approximate a 'typical' journal, average values of all major cost and revenue components were calculated for the five paper-based journals in the sample. This 'average' or 'typical' journal would have 121 pages per issue and a press run of 1700 copies. Our average journal shows a net operating loss of approximately \$5,000 on revenues of \$69,000 in 1994. Based on our interviews with the editors and publishers, we believe this to be an acceptable generalization for a large journal. In Canada, a journal with a press run of 1000 is considered a 'healthy' journal. The reclassified statements and summary statements on which this generalization is based are

presented as Exhibits 1 through 8. Note that, depending upon the size of the issue and the frequency of publication, the costs of an actual (real) journal may deviate from those of the 'average' journal described here. However, these differences are not expected to materially affect the overall thrust of our conclusions.

Exhibits 1 and 2 show the three year average dollar and percentage breakdowns of revenues and expenses associated with the publishing of the five academic journals. Exhibits 3 to 8 present similar supporting data on a per-journal basis. Analysis of individual categories of costs and revenues can be summarized as below:

Revenues:

On average, Subscription revenues, Association support and SSHRC grants are, by far, the largest source of funding for journals (87% of total costs, in 1994). SSHRC grants range from 24% to 48% of revenues. Subscriptions as a proportion of overall sources ranged from 37% to 61% over four journals, with Journal E reporting only 6%. This was due to a compulsory association membership, through which the journal receives financing on a per member basis. Including the Association support with Subscriptions, these combined revenues range from 40% to 61% of total funding across all five journals.

On a percentage basis, the relative importance of subscription revenues and funding sources has remained fairly constant over the past three years. However, total revenues for several of the journals have risen somewhat since 1992. The average journal revenue was \$66,380 in 1992 and \$69,000 in 1994. This increase in revenues may be driven by a need to balance operating budgets, which showed slightly larger deficits in the earlier periods. The overall increase is primarily due to increases in Subscriptions, Advertising revenues, and Association Support.

It should be noted that categories like advertising, back issue sales, and reprints are fairly small for all journals. We were also unable to differentiate between institutional subscriptions and individual subscriptions. Our estimate is that, for journals which cover mostly Canadian topics and subjects, international institutional subscriptions may not be very significant. Our conversation with one publisher indicates that most of any future revenue increases can be expected to come from institutional subscriptions outside North America, but only for those journals which have an international orientation. A typical Canadian journal with an international orientation may have up to 200 institutional subscribers. Thus, depending upon the nature of the journal, the importance of institutional revenues may differ across journals.

Costs:

Analysis of the financial statements resulted in the logical grouping of costs into six categories: Administration, Editorial management, Promotion, Typesetting, Printing, and Shipping (distribution). The first three categories, namely Administration, Editorial management and Promotion, can be considered the fixed costs of running a journal. The Copy editing and Typesetting costs are less fixed as these depend upon the number of pages and the number of figures and charts per volume. The Printing (including cover pages and binding) and Shipping costs are variable costs and are based on the number of copies in the press run.

As in the case of revenues, cost categories based on percentage show a considerable consistency over the three years studied. As a percentage of costs, printing has decreased somewhat, presumably due to decreased print runs. We do not have data on the annual press run for each of the three years but this observation is supported with anecdotal evidence provided by some of the interviewees. There were other small increases in all other categories. In terms of absolute dollars, the average journal experienced virtually no increase in costs (roughly \$200 per annum). Overall expenses

have decreased slightly for the sample journals over the past three years. On average, Editing was the only significant cost category to show an increase.

A summary of these various exhibits allows us to construct the following revenue and cost breakdown for a typical, middle of the range, Canadian journal in Social Sciences and Humanities for the most current year. Our analysis also indicates that most journals are running at a break-even level by adjusting funding from association or other funding resources as required. This typical journal has approximately \$70,000 annual revenues and costs.

1994 Revenues:		1994 Costs:	
<i>Subscriptions</i>	42%	<i>Admin.</i>	25%
<i>Advertising</i>	4%	<i>Editorial</i>	23%
<i>Back Issue Sales</i>	1%	<i>Typesetting</i>	9%
Association Support	12%	Printing	28%
SSHRC Grant	34%	Shipping	12%
Other Funding	8%	Promotions	2%
Total (rounded)	<u>100%</u>	Total (rounded)	<u>100%</u>

Amongst the five journals comprising this sample, expenses showed a much greater degree of variation than did revenue categories; however, the above table can be considered as representative of a typical journal.

Another way of analyzing a journal is on a per unit basis. Exhibit 9 shows an analysis of publishing and printing expenses for a typical journal based on quotes from publishers (private and university-based). The estimates provided in this exhibit indicate that, for a journal which is published quarterly, has 96 to 120 pages per issue and a press run of

1200 copies, the printing and distributing costs are in the range of \$30,000 to \$40,000. These numbers correspond favourably to the breakdown of costs in the table above.

There are two categories of costs that require special mention. The first category is the portion of printing costs attributable to the cost of paper. As seen from exhibit 9, printing costs constitute almost 45 percent of the total second phase' costs (approximately 3 cents per page).^v An increase in the paper costs as evidenced recently would further increase these overall printing costs.^{vi} The second cost category relates to mailing costs; which have increased recently but are still relatively small for distribution within Canada. These may also face increase as the government continues to review its subsidies to Canada Post.^{vii} An increase in these costs may also affect paper-based journals adversely.

There are many hidden expenses that this table does not consider. These mostly relate to 'in-kind' support provided by the universities where the editors of these journals work. In some cases, the journal (actually the Association supporting the journal) and the University come to an agreement on sharing of expenses. These expenses include office space, sharing of secretarial support, storage space, supplies, photocopy access, computer equipment, etc. In some cases, the editor gets a partial release from teaching to conduct editorial duties. We have no estimates of these in-kind costs. But in the context of this project, most of these belong in the 'first copy' category and are not expected to change even if the journal changes from a paper-based format to an E-journal one. If anything, costs related to storage and supplies may decrease somewhat with a an E-journal.

We would also like to note some other caveats with respect to this table. We only have five sample journals; and therefore some variations will be present in our generalization. We have had to account for some significant differences even within the five journals analyzed here. In some cases, the financial statements provided to us were

on an 'aggregate' basis meaning journal costs were combined with other costs; supplementary questions were required in the phone interviews for further clarification of some expense categories. Notwithstanding these challenges of generalization, we believe that the exhibits and the table above are a fair representation of the costs and revenues of a typical Canadian journal in the Social Sciences and Humanities.

4.2 A Typical E-journal

Prior to describing the cost-revenue analysis for an E-journal, we would like to refer to four specific references to the relative costs of producing an E-journal that we came across in literature survey.

Harrison and Stephen (1993) estimate the costs of producing an ascii E-journal for 200 subscribers, on a per issue basis, at \$1,057. However, these costs ignore a significant amount of time and energy spent by volunteers who were dedicated to ensuring that the costs were kept low. They also note that these estimates ignore the costs of developing the software display and those for a journal with much richer formatting than the plain ascii format, and the estimates are for a very small (200 subscriber) journal.

Harnard (in Duranceau, 1995, p.79) claims that the costs of producing Psychology as an E-journal are \$15,000 per year. This represents a production saving of 20 to 30 percent over a comparable paper-based journal. The only electronic journals that can claim higher costs would be either 1) operating on a subscription basis and thereby incurring higher costs, or 2) producing a hybrid journal.

Wolffrey (1993) provides a more scientific estimate of the relative costs of producing an E-journal. She estimates that the typical printing related costs of a paper-based journal are in the range of 24 to 32 percent of the total costs. Since these costs can be completely eliminated in an E-journal, 25 to 30 percent savings are possible.

Fisher (in Duranceau, 1995, p.89) provides some cost estimates for the Chicago Journal of Theoretical Computer Science (CJTCS) - the first E-journal to be published by the MIT press. He claims that although the printing related costs for CJTCS constitute only 10 percent of the total costs, versus 45 percent for an equivalent paper-based journal, the total savings may be less due to two factors. First, the subscription revenues may be less, thereby reducing journal revenues by an equivalent of 25 percent. Second, the marketing expenses for the CJTCS are expected to be high to encourage submissions and get acceptance in the academic community. These costs are start-up costs for any new journal but may be higher for CJTCS because of its electronic nature.

As can be seen, the cost-revenue analysis of an E-journal is not as straightforward as that for the paper-based journals. This is due to two reasons. First, the historical costs of an E-journal are meaningless due to the rapid advances in technology. Second, many of the peer-reviewed journals are somewhat new and are unable to provide their own cost-revenue data. More specifically, all electronic journals studied are start-up journals, although one publisher did produce a similar paper journal several years ago. Two are well established, two are publishing their first issue this spring, and one will be up-and-running in early 1996.

Thus, the 'incremental' analysis of E-journal versus paper-based journal expenses needs to be conducted from the viewpoint of typical revenues and cost structure for establishing a new E-journal today using the latest technology. Our approach in the interviews of E-journal editors/publishers was to ask them the estimates of costs-revenues if they were to initiate an E-journal today. Based on these interviews, one can then compare these estimates with our analysis of the paper-based journals.

On the revenue side, all electronic publishers are offering their journals free of charge. Only one has SSHRC funding at this time. All but one of these journals started new -

that is they did not have an existing paper-based journal as their origin. Thus, they did not provide any specific estimates of what would happen to the revenues of an existing journal if it were to be converted from paper-based to an E-journal format. However, it was clear that none of them wished to charge for their E-journal.

On the cost side, it was obvious that the Printing and Shipping costs all vanish in electronic publishing. The Typesetting costs are substituted by the 'mark-up' related costs. However, additional costs are now incurred for the necessary technological resources and equipment including access to the server, server maintenance, desktop computers, costs of assistance to setup each issue, costs to manage HTML links and subscriber queries. In our interviews with the E-journal editors, all claimed that most of these costs are either negligible, or are absorbed by the University or funded by other sources which are willing to provide funding for experimenting with this new technology. Moreover, the publishers of electronic academic journals all cite the ability to produce their journals with substantial "free resources". These are hidden subsidies in the form of University space and systems access and support. Currently, there seems to be a strong spirit for making the journals work, and those involved are donating their time (or their University's) due to their 'love' of technology and their interest in using the technology in an innovative manner. Given this somewhat free technical help, there are no added costs but only cost savings. However, this can not continue to be the case and must be accounted for in the incremental analysis. The estimates are that for a typical E-journal, these system related efforts would require one or two days a week of a systems specialist.

It should also be noted that none of these editors was particularly concerned about incremental marketing costs. It was assumed that the journal would automatically (or over time) establish its own reputation. This assumption is contradicted by Fisher (1993) who claims that a new E-journal may have somewhat higher marketing costs than a new paper-based journal. Although, neither indexing nor archiving were mentioned as

an important consideration, most respondents expressed a need for a centralised mechanism for indexing and archiving of their journals. The respondents spoke about the elimination of office costs for an E-journal, but as mentioned earlier, these can be eliminated even for a paper-based journal. Any advantage of E-journals in this category can not be considered as an incremental advantage over paper-based journals.

4.3 Incremental Analysis

In conducting an incremental analysis, we must deal separately with two distinct situations, each with a very different outcome. The first situation deals with the conversion of an existing paper-based journal to an E-journal. The second situation deals with the cost-revenue structure of starting an E-journal from scratch. The most important difference is the impact on revenues and start-up costs including incremental marketing costs. We first deal with the conversion of an existing paper-based journal to an E-journal.

4.3.1 The Conversion case

The following incremental analysis is based on the premise that an existing paper-based journal fully switches to an electronic journal format using HTML conversion of electronic (word processor) submissions. We only consider items which are 'incremental' in this conversion decision. We specifically exclude three cost factors from the comparison. First is savings that can be achieved through the on-line (electronic) peer-review and submission system of an E-journal. The reason is that this system could be equally extended to an existing paper-based journal. Secondly, it is assumed that computers and other equipment required by the editorial office is already available and can be readily used; thus there are no incremental costs. Third, some E-journals interviewed indicated further savings through donated editorial and administrative time, due to the current excitement about and interest in the electronic media and enthusiasm

for establishing a brand new E-journal. However, there is no logical reason why this option should not be also applicable to paper-based journals. In the longer run, these cost savings should be expected to be similar to paper-based journals and can not be considered as additional savings.

The ultimate economic advantage of converting a paper-based journal to an E-journal is contingent on several assumptions. In the literature, and to some extent in discussions with E-journal editors, the impact on revenues seems to be a less important issue than cost savings, since most of the discussions are about establishing a brand new E-journal. This is not the case in the 'conversion' context. In this situation, a careful analysis of the potential revenue impact is warranted.

First, let us consider the potential revenue impact of converting a paper-based journal to an E-journal. This impact would depend upon a variety of factors and potentially different for each case. The actual impact would depend upon the support provided to the journal by the sponsoring association (if one exists), the culture of the member group that would affect their monetary support, the mix of members and non-members in subscribers and the dependence of the journal on institutional subscriptions.

Therefore, we consider three revenue impact scenarios. In all three scenarios we assume that the existing SSHRC and other similar funding remains intact. It should be also noted that, in our analysis, we assume that our typical paper-based journal is managed as a typical break-even operation with cost and revenues of approximately \$70,000.

The first revenue scenario assumes that the journal is offered free of charge to everyone. In addition, it also assumes that Association support falls by 30% due to a possible decline in members who now have access to a free journal and decide to cancel their association membership. Revenues from Advertising and Back Issue Sales

also disappear. The net result of these assumptions is that Revenues decline by 60%. This we consider the 'worst case' scenario.

The second revenue scenario assumes continued full Association support and the introduction of a mechanism to receive at least some subscription revenue from institutions. More specifically, we assume that 30% of current subscription revenue is maintained. This results in an overall reduction of 41% from current revenues. This, we consider the 'most likely' scenario.

The 'best', but much less likely, revenue scenario would be the full maintenance of current subscriptions. In this case, only 6% of revenues would be lost, through elimination of advertising and back issue sales. Exhibit 10 shows details about the first two scenarios; the third one is quite straight forward and does not require formal analysis.

Next, we assume two cost scenarios. Note that some cost savings are obvious: typesetting, printing and shipping will no longer be required. However, as noted, there will be a requirement for conversion and formatting of documents and ongoing system maintenance. Also depending upon the subscription fee strategy, office expenses would vary. Exhibit 11 derives the mean dollar and percentage savings assuming additional expenses are required for conversion and systems administration (28% of total costs). Our first cost scenario assumes that these savings will be achieved. On the other hand, E-journals interviewed indicated that these services are currently available to them on a free or cost-neutral basis. In this scenario, the savings would be 48% for our typical paper journal going "electronic". This represents our second cost scenario under case 2 in exhibit 11.

The three revenue scenarios now can be matched with the two cost scenarios ("free" or paid conversion and systems support). In all cases, an important premise is that current

University, SSHRC and Foundation funding would continue. Due to their small magnitude, we also exclude potential changes in the office expense category.

It should be noted that these scenarios can be viewed as 'reasonable' description of potential scenarios that encompass a good forecast of the future. No one scenario explains reality for every journal; however, on a combined basis, they provide a good approximation of the cost-revenue impact of conversion. It is evident that, due to the importance of subscription revenues on a journal, each journal would have to examine its individual situation prior to converting the existing paper-based journal to an E-journal. The table below shows the potential 1994 impact on a typical paper-based journal of becoming electronic under the three scenarios.

Economic Impact of a Switch to E-journal Format

	Worst case	Most likely case	Best case
Revenues scenarios β	Subscriptions down 100%, Assn. Support down by 30%	Subscriptions down by 70%, Assn. Support maintained	Subscriptions shift to Assn. Support, Assn. Support intact
Expense scenarios β			
Systems Admin. & Conversion is cash cost	Rev Loss: 60% Cost Saving: 28% Net Loss: 32%	Rev Loss: 41% Cost Saving: 28% Net Loss: 13%	Rev Loss: 6% Cost Saving: 28% Net Gain: 22%
University Provides Systems Admin. & Conversion Support	Rev Loss: 60% Cost Saving: 48% Net Loss: 12%	Rev Loss: 41% Cost Saving: 48% Net Gain: 7%	Rev Loss: 6% Cost Saving: 48% Net Gain: 42%

In the 'worst case' scenario where subscriptions are eliminated and association support declines, the conversion of a typical paper-based journal to an E-journal does not appear to have positive gains in a purely economic sense. In fact, if technical support must be paid for by the journal, there is, in effect, a 32 percent net loss. On the other hand, the journal may experience a relatively neutral financial impact (the 'most likely' scenario) if 30% of current subscriptions are sustained and association support is maintained. The journal would decisively gain if associations (or other sources) could offset the funding lost by offering free access to the on-line journal. The 'best case' scenario is the one where there is no decrease in subscription revenues and association support; in this case, all savings associated with the reduced printing costs accrue to the journal. If, in addition, it can generate additional sources of funding for technical support or an increase in advertising revenues, it may gain even more.

It should be emphasized that the figures presented in above table reflect a journal assumed to have an average of 121 pages per quarter and an average press run of 1700 copies. The financial impacts do depend on journal size. That is, as number of pages and copies increase, savings in typesetting, printing, and distribution increase with no corresponding increase in conversion costs and systems administration for the E-journal. However, there would be a corresponding increase in lost subscription revenues for larger circulations.

Overall, these estimates partially support the cost savings often cited in the literature ranging from 30 percent to even 50 percent if technical support is received free. However, these savings are offset by potential reduction in subscription and other revenues especially in the 'conversion' situation. Thus, there is clearly a trade-off between cost and revenues; one cannot be considered without the other.

Thus, the main issue in the 'conversion' case is the potential for decrease in revenues. If revenues are unaffected (a typical assumption in some published articles), then all cost savings are incremental. However, the biggest unknown for an existing paper-based journal is the revenue impact; each must estimate this impact prior to a decision about conversion.

4.3.2 The case of a brand new E-journal

For a brand new E-journal, a potential case can be made simply based on cost savings - which can be in the range of 28 to 48 percent, a conclusion consistent with some of the earlier articles. However, it should also be noted that even with these savings, the E-journal would still have expenses in the range of \$30,000 to \$40,000 if it is a fairly middle size journal. These are essentially 'first copy' expenses and some technical systems related expenses. Since the E-journal would have no source of revenue, current levels of funding from SSHRC or other agencies would still be required unless significant cost savings can be achieved in this expense category by converting this process to an electronic one.

However, it is unrealistic to assume that this will reduce expenses drastically since many of the first copy activities would still be required.

4.3.3. Summary

Thus no matter which situation is assumed (conversion versus brand new), the issue is the trade off between costs and revenues. Currently, funding sources are approximately equal to 'first copy' costs and the subscription revenues plus association support is equal to the printing and distribution costs. Going electronic may eliminate this transfer of revenues to printers. If on the other hand, revenues for an E-journal remain (or are generated) at the same level as that for a paper-based journal, then the funding sources are not as critical to on-going operations. The trade-offs are clear: if subscription revenues plus association support remains at the \$30,000 to \$40,000 level, then the E-journal requires no other funding. If this revenue source is not available, then the funding agencies must maintain the current levels of support.^{viii} The main party affected is the publisher, who loses revenues in either case. So from a purely economical perspective, the net benefits of an E-journal over a paper-based journal depend upon the revenue assumptions; the case for cost savings is quite straight forward given the usual caveats concerning start-up costs.

4.4 Some other Issues

It is clear that on a pure on-going cost basis analyzed at the journal level, an E-journal provides cost savings by eliminating the need for incurring printing and distribution expenses. Depending upon the subscription revenue impact, it is possible that these savings may not be sufficient to compensate for the revenue loss.

The analysis does not cover the quantitative and qualitative impact of some other considerations that may require further thought. First, this is a partial analysis meaning that it only looks at costs at the journal level. It can be argued that the incremental costs that the

user may have to incur to access an E-journal can be substantial. It is impossible to estimate these costs, since these would depend upon the technological sophistication of the reader base. Second, there may be a variety of innovative ways to deliver an E-journal to the reader which may allow for advertising or collection of charges on a per use basis. However, it may also imply higher costs. The soon-to-be-released encryption standards for the commercial Internet may be relevant to this consideration. Third, there is the issue of start-up costs from both the technology and marketing viewpoint. The technology is changing rapidly; and academic editors may require considerable support in ensuring that the journal quality is maintained throughout the mark-up process. Currently, these concerns are mitigated by using professional printing services. Fourth, there is still a feeling that E-journals are not in the 'same league' as traditional paper-based journals; to change this perception may require higher marketing costs. We have no estimates for these costs and have not been able to factor them into our analysis. Our analysis also excludes the potential savings that can be achieved by converting some of the 'first copy' related tasks from traditional to electronic methods; these are not considered to be 'incremental' cost savings.

There are some qualitative issues as well. It is clear that an E-journal may allow much more rapid dissemination of knowledge as it can publish a paper as soon as it is accepted and not wait for the volume. It can also allow for better searching at the researcher's desk, rather than searching through commercial data bases and visiting the library to read a specific paper. It can also allow for 'print on demand' or 'store only if needed'; this would reduce processing time and costs. On the other hand, many would need to acquire a new discipline for reviewing the E-journal rather than waiting for the journal to arrive in the mail. None of these qualitative factors are accounted for in our cost-revenue analysis above.

There is one more issue that requires special mention. Our research indicates that there has been a consolidation in the printing business. There are a small number of publishers who are now publishing a large number of academic journals. Their advantage is that they seem to provide economies of scale and scope over publishing each journal by an

individual academic editor. The net effect of this consolidation is reduced costs of printing and distribution.

Similar economies of scale are also possible in the E-journal publishing. If a central location can be organised to provide services to all E-journals, significant savings are possible. A very good example of this centralised process is described in Quinn and McMillan (in Duranceau, 1995, p. 81). They describe their experience with electronic publishing at Virginia Tech. They claim that a small centralised E-publishing department of five people can be established to provide centralised E-journal publishing services to a large number of journals. In their view, this department would consist of a Director (responsible for outreach), an Administrator (to maintain and upgrade hardware, Unix admin, security), a Software Manager (responsible for the selection of software tools, query design, interface design, etc.), a Database Manager (to maintain data base, indexing, file problems, etc.), and an Office Manager (to handle routine functioning of the office). This group can now internalise all the technical knowledge necessary to provide economies of scale and scope.

Quinn and McMillan note that a similar group of five people is currently managing two newspapers, 14 journals, abstracts of six more, and a large image data base and it is far from capacity. Currently the main bottleneck is the quality of files sent by the editors; but with training handling these will be drastically reduced from the current thirty minutes per article. Salaries in Virginia cost \$130,000 for this group, annual outlays in equipment are \$40,000 including start-up costs, software \$5,000, and other expenses \$15,000, plus rent and other. Thus total is \$200,000. The author claims that 2000 journals (500, if quarterly) can be supported at a cost of \$1,000 per journal (annual) or \$4,000 per quarterly journal. With an additional database manager they could support 400 journals. If libraries (or a government agency) support this group collectively, the cost per journal would be very small. Their preliminary figures indicate that the costs per journal for the 'post-first copy' phase can be as low as \$5,000 per year if managed centrally. If this experience can be

replicated in Canada, it would represent significant improvements in efficiency in publishing E-journals.

5.0 Summary and Conclusions

The main purpose of this report was to provide an analysis of the economics of the E-journal relative to its paper-based counterpart. The analysis is based on a review of the literature and interviews with the editors/publishers of paper-based and E-journals.

Our analysis indicates that the costs of producing and distributing an E-journal can be 28 to 48 percent lower than that of its paper-based counterpart. However, these savings can be offset almost completely by a reduction in subscription revenues. These reductions are especially important in the case where an existing paper-based journal is considering becoming an E-journal. In either case, the net loser will be the commercial printers, whose revenues would disappear. The E-journals would continue to require support for their operations; a typical E-journal has an administrative component, which if continued in the traditional manner, would still incur an expense of \$30,000 to \$40,000 per year. Only in the case where either the 'first copy' costs are substantially reduced, or where the subscription revenues and/or association support is maintained, can an E-journal be published without any additional support. The trade-off is simply between the subscribers of paper-based journals and associations, who essentially pay for the printing expenses, and the funding agencies who fund the traditional 'first copy' costs.

From an overall perspective, improving of the cost-revenue structure of publishing a journal in the Social Sciences and Humanities may require two initiatives. The first initiative would be to conduct a sample 'activity-based' costing exercise to understand the 'first copy' costs and then to provide training to editors/administrators and referees to reduce these costs. This can be done even if the journals have no intention of converting to an E-journal format. These first copy costs are almost 50 percent of the total costs of a paper-based journal.

These costs are now directly supported directly by funding agencies and by associations which are indirectly supported by funding agencies.

The second initiative would concentrate on reducing the technical costs of producing and maintaining an E-journal. Here, significant economies of scale are possible by providing these services from a central location to all E-journals. The process would be very similar to the current process in publishing a paper-based journal. Instead of sending the electronic versions to the commercial printer (as is done now), these would be sent to the 'electronic' non-profit printer. This non-profit printer would do the mark up, put it on the server and manage all the technical aspects of electronic publishing for all journals. This non-profit printer could simply be a group which is already publishing a state-of-the-art E-journal in Canada and would be willing to be this non-profit electronic printer to serve the entire E-journal community. It is also possible that this method can be funded by the government or other funding agencies as a transitional measure. In the beginning, it would be made available to any paper-based journal which can continue to publish in the traditional the paper-based form until it is convinced of the merits of publishing entirely as an E-journal.

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EXHIBITS (TAB E)

	Year		
	1992	1993	1994
	Mean	Mean	Mean
	\$	\$	\$
Ave pages per Issue			0
Annual Pages			425
Press Run			1,700
Revenues			
Subscriptions	\$28,604	\$27,830	\$31,679
Advertising	780	1,708	2,302
Back Issue Sales	1,069	213	1,000
Reprints	0	0	0
Association Support	4,985	5,958	6,303
SSHRC Grant	20,255	19,660	20,237
Other Funding	10,687	5,090	7,486
Total Revenues	\$66,380	\$60,459	\$69,008
Expenses			
Administration	\$19,241	\$16,859	\$17,706
Editing	18,395	10,977	19,570
Typesetting	7,172	6,607	7,856
Printing	19,488	19,707	18,676
Shipping & Handling	8,306	9,112	8,767
Promotions	1,240	1,783	1,427
Total Expenses	\$73,842	\$65,046	\$74,002
Net	(\$7,462)	(\$4,587)	(\$4,994)

Note: Journal A data not available for 1993

Exhibit 1: Mean 5 Paper-Based Journals - 3 Year Comparison (in \$)

	Year		
	1992	1993	1994
	% of Category	% of Category	% of Category
Ave pages per Issue			0
Annual Pages			425
Press Run			1,700

Revenues

Subscriptions	41.55%	41.16%	41.89%
Advertising	1.11%	3.04%	3.52%
Back Issue Sales	1.93%	1.07%	1.22%
Reprints	0.00%	0.00%	0.00%
Association Support	9.96%	11.61%	11.54%
SSHRC Grant	35.08%	36.77%	33.50%
Other Funding	10.37%	6.35%	8.32%
Total Revenues	100.00%	100.00%	100.00%

Expenses

Administration	24.91%	27.02%	25.33%
Editing	22.07%	14.96%	23.12%
Typesetting	8.44%	8.32%	9.05%
Printing	31.20%	33.16%	28.38%
Shipping & Handling	11.73%	13.93%	12.29%
Promotions	1.65%	2.61%	1.83%
Total Expenses	100.00%	100.00%	100.00%

Note: Journal A data not available for 1993

Exhibit 2: Aggregate 5 Paper-Based Journals - 3 Year Comparison (in %)

	Journal					Total	Mean Journal
	A	C	D	E	F		
Frequency (1994)	Qtr	Bi	Qtr	Qtr	Qtr		
Ave pages per Issue	180	150	128	100	48		
Annual Pages (1994)	720	300	512	400	192	2,124	425
Press Run (1994)	1700	300	1400	1100	4000	8,500	1,700
Revenues							
Subscriptions	44,972	6,200	32,260	4,249	55,337	143,018	28,604
Advertising	382	0	227	1,400	1,890	3,899	780
Back Issue Sales	4,025	366	954		0	5,345	1,069
Reprints						0	0
Association Support			\$10,166	14760		24,926	4,985
SSHRC Grant	22,542	6,137	23,260	16,070	33,267	101,276	20,255
Other Funding	3,164		658	6,000	43,614	53,436	10,687
Total Revenues	\$75,085	\$12,703	\$67,525	\$42,479	\$134,108	\$331,900	\$66,380
Expenses							
Administration	24,342	8,726	24,314	4,627	34,195	96,204	19,241
Editing	33,404	7,667	17,564	1,398	31,942	91,975	18,300
Typesetting	9,402	1,505	*	4,624	20,327	35,858	7,172
Printing	19,448	10,668	21,595	18,901	26,826	97,438	19,488
Shipping & Handling	7,661	6,534	4,052	4,319	18,967	41,532	8,306
Promotions	90	439		1,304	4,368	6,201	1,240
Total Expenses	\$94,347	\$35,539	\$67,525	\$35,173	\$136,625	\$369,209	\$73,842

* - could not separate from admin. costs (impact appx 3% to overall line items)

"Other Funding" includes non-sshrc grants and all other sources of income

Exhibit 3: 1992 Revenues and Expenses for 5 Paper-Based Journals (in \$)

	Journal					Total	Mean Journal
	A	C	D	E	F		
Frequency (1994)	Qtr	Bi	Qtr	Qtr	Qtr		
Ave pages per Issue	-	150	128	100	48		
Annual Pages (1994)	-	300	512	400	192	1,404	351
Press Run (1994)	-	300	1400	1100	4000	6,800	1,700
Revenues							
Subscriptions	-	6,110	31,000	3,916	70,295	111,321	27,830
Advertising	-	0	0	5,002	1,831	6,833	1,708
Back Issue Sales	-	469	382			851	213
Reprints	-					0	0
Association Support	-		\$7,811	16,020		23,831	5,958
SSHRC Grant	-	6,137	23,260	15,977	33,267	78,641	19,660
Other Funding	-		484	6,177	13,697	20,358	5,090
Total Revenues	-	\$12,716	\$62,937	\$47,092	\$119,090	241,835	\$60,459
Expenses							
Administration	0	8,163	27,381	9,521	22,373	67,438	16,859
Editing	0	7,994	3,378	2,186	30,349	43,908	10,977
Typesetting	0	1,582	*	5,533	19,313	26,428	6,607
Printing	0	7,258	25,891	22,619	23,060	78,828	19,707
Shipping & Handling	0	7,518	6,287	2,889	19,755	36,449	9,112
Promotions	0	585		2,308	4,240	7,133	1,783
Total Expenses	\$0	\$33,100	\$62,937	\$45,056	\$119,090	260,183	\$65,046

Journal A data for 1993 unavailable (Ave adjusted)

* - could not separate from admin. costs (impact appx 3% to overall line items)

"Other Funding" includes non-sshrcc grants and all other sources of income

Exhibit 4: 1993 Revenues and Expenses for 5 Paper-Based Journals (in \$)

	Journal					Total	Mean Journal
	A	C	D	E	F		
Frequency	Qtr	Bi	Qtr	Qtr	Qtr		
Ave pages per Issue	180	150	128	100	48		
Annual Pages	720	300	512	400	192	2,124	425
Press Run	1700	300	1400	1100	4000	8,500	1,700
Revenues							
Subscriptions	57,744	6,639	24,500	3,000	66,514	158,397	31,679
Advertising	814	0	300	6,000	4,398	11,512	2,302
Back Issue Sales	1,181	125	1,313		2,380	4,999	1,000
Reprints						0	0
Association Support			\$15,497	16020		31,517	6,303
SSHRC Grant	22,542	6,137	23,260	15,977	33,267	101,183	20,237
Other Funding	12,417		713	6,000	18,301	37,431	7,486
Total Revenues	\$94,698	\$12,901	\$65,583	\$46,997	\$124,860	\$345,039	\$69,008
Expenses							
Administration	17,687	8,195	28,938	9,650	24,059	88,529	17,706
Editing	43,967	8,177	10,398	2,200	33,107	97,849	19,577
Typesetting	10,690	1,628	*	5,897	21,068	39,282	7,856
Printing	19,347	6,903	20,851	24,103	22,174	93,378	18,676
Shipping & Handling	7,512	7,638	5,396	3,000	20,287	43,833	8,767
Promotions	1,025	696		1,250	4,165	7,136	1,427
Total Expenses	\$100,228	\$33,237	\$65,583	\$46,100	\$124,860	\$370,008	\$74,002

* - could not separate from admin. costs (impact appx 2-3% to overall line items)

"Other Funding" includes non-sshrc grants and all other sources of income

Exhibit 5: 1994 Revenues and Expenses for 5 Paper-Based Journals (in \$)

	Journal					Mean
	A	C	D	E	F	
Frequency (1994)	Qtr	Bi	Qtr	Qtr	Qtr	
Ave pages per Issue	180	150	128	100	48	
Annual Pages (1994)	720	300	512	400	192	425
Press Run (1994)	1700	300	1400	1100	4000	1,700
Revenues						
Subscriptions	59.89%	48.81%	47.77%	10.00%	41.26%	41.55%
Advertising	0.51%	0.00%	0.34%	3.30%	1.41%	1.11%
Back Issue Sales	5.36%	2.88%	1.41%	0.00%	0.00%	1.93%
Reprints	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Association Support	0.00%	0.00%	15.06%	34.75%	0.00%	9.96%
SSHRC Grant	30.02%	48.31%	34.45%	37.83%	24.81%	35.08%
Other Funding	4.21%	0.00%	0.97%	14.12%	32.52%	10.37%
Total Revenues	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Expenses						
Administration	25.80%	24.55%	36.01%	13.15%	25.03%	24.91%
Editing	35.41%	21.57%	26.01%	3.97%	23.38%	22.07%
Typesetting	9.97%	4.23%	*	13.15%	14.88%	8.44%
Printing	20.61%	30.02%	31.98%	53.74%	19.63%	31.20%
Shipping & Handling	8.12%	18.39%	6.00%	12.28%	13.88%	11.73%
Promotions	0.10%	1.24%	0.00%	3.71%	3.20%	1.65%
Total Expenses	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

* - could not separate from admin. costs (impact appx 2-3% to overall line items)

"Other Funding" includes non-sshrc grants and all other sources of income

**Exhibit 6: 1992 Revenues and Expenses for 5 Paper-Based Journals
(% of Category)**

	Journal					Mean
	A	C	D	E	F	
Frequency (1994)	Qtr	Bi	Qtr	Qtr	Qtr	
Ave pages per Issue	-	150	128	100	48	
Annual Pages (1994)	-	300	512	400	192	351
Press Run (1994)	-	300	1400	1100	4000	1,700

Revenues

Subscriptions	0.00%	48.05%	49.26%	8.32%	59.03%	41.16%
Advertising	0.00%	0.00%	0.00%	10.62%	1.54%	3.04%
Back Issue Sales	0.00%	3.69%	0.61%	0.00%	0.00%	1.07%
Reprints	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Association Support	0.00%	0.00%	12.41%	34.02%	0.00%	11.61%
SSHRC Grant	0.00%	48.26%	36.96%	33.93%	27.93%	36.77%
Other Funding	0.00%	0.00%	0.77%	13.12%	11.50%	6.35%
Total Revenues	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Expenses

Administration	0.00%	24.66%	43.51%	21.13%	18.79%	27.02%
Editing	0.00%	24.15%	5.37%	4.85%	25.48%	14.96%
Typesetting	0.00%	4.78%	*	12.28%	16.22%	8.32%
Printing	0.00%	21.93%	41.14%	50.20%	19.36%	33.16%
Shipping & Handling	0.00%	22.71%	9.99%	6.41%	16.59%	13.93%
Promotions	0.00%	1.77%	0.00%	5.12%	3.56%	2.61%
Total Expenses	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Journal A data for 1993 unavailable (Ave adjusted)

* - could not separate from admin. costs (impact appx 2-3% to overall line items)

"Other Funding" includes non-sshrc grants and all other sources of income.

Exhibit 7: 1993 Revenues and Expenses for 5 Paper-Based Journals (% of Category)

	Journal					Mean
	A	C	D	E	F	
Frequency	Qtr	Bi	Qtr	Qtr	Qtr	
Ave pages per Issue	180	150	128	100	48	
Annual Pages	720	300	512	400	192	425
Press Run	1700	300	1400	1100	4000	1,700
Revenues						
Subscriptions	60.98%	51.46%	37.36%	6.38%	53.27%	41.89%
Advertising	0.86%		0.46%	12.77%	3.52%	3.52%
Back Issue Sales	1.25%	0.97%	2.00%		1.91%	1.22%
Reprints						0.00%
Association Support			23.63%	34.09%		11.54%
SSHRC Grant	23.80%	47.57%	35.47%	34.00%	26.64%	33.50%
Other Funding	13.11%		1.09%	12.77%	14.66%	8.32%
Total Revenues	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Expenses						
Administration	17.65%	24.66%	44.12%	20.93%	19.27%	25.33%
Editing	43.87%	24.60%	15.85%	4.77%	26.51%	23.12%
Typesetting	10.67%	4.90%	*	12.79%	16.87%	9.05%
Printing	19.30%	20.77%	31.79%	52.29%	17.76%	28.38%
Shipping & Handling	7.49%	22.98%	8.23%	6.51%	16.25%	12.29%
Promotions	1.02%	2.09%		2.71%	3.34%	1.83%
Total Expenses	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

* - could not separate from admin. costs (impact appx 2-3% to overall line items)

"Other Funding" includes non-sshrc grants and all other sources of income

**Exhibit 8: 1994 Revenues and Expenses for 5 Paper-Based Journals
(% of Category)**

Presses

Expenses	per unit:	A	per unit:	B	per unit:	C	per unit:	D
	COPIES PAGES	1200 100	COPIES PAGES	1200 96	COPIES PAGES	1200 100	COPIES PAGES	1200 102
Copy Editing								
Basic	\$13.00	1,300	\$10.00	960	\$13.00	1,300	\$10.00	1,020
Corrections		0		0		0		250
		\$1,300		\$960		\$1,300		\$1,270
Typesetting								
Per Page	\$30.00	3,000	\$20.00	1,920	\$0.00	0	\$0.00	3,135
Flat							\$7.00	714
Tables/Figures		0	\$20.00	100	\$0.00	0	\$0.00	0
Author's Alterations		0	\$60.00	0	\$0.00	0	\$0.00	0
		\$3,000		\$2,020		\$0		\$3,849
Printing								
Fixed		4,350		4,920		5,790		2,430
Graphs	20 \$7.50	150	\$80.00	160	\$0.00	0	\$0.00	0
Reprints	25 \$0.06	150	\$2.00	192	\$0.00	0	\$0.00	75
		\$4,650		\$5,272		\$5,790		\$2,505
Mailing								
Handling, Packaging	\$0.30	355	\$0.20	240	\$0.20	240	\$0.12	144
Fixed per Issue	\$60.00	60	\$0.00		\$0.00		\$0.00	190
Postage	\$0.13	156	\$0.13	156	\$0.13	156	\$0.13	156
		\$571		\$396		\$396		\$490
Promotion		413		0		0		0
Total Expenses per Issue		\$9,934		\$8,648		\$7,486		\$8,114
Total Expenses per Year		\$39,735		\$34,592		\$29,944		\$32,456

Exhibit 9: Comparison of Commercial Press Bids (1993)

CASE 1

Revenues		A	B	C=A-B	D=C/SUMC
Paper	Electronic	Paper-Based Mean	E-Journ	Losses	Losses
		\$	\$	\$	%
Subscriptions	Subscriptions	\$31,679	\$0	\$31,679	51.49%
Advertising	Advertising	\$2,302	\$0	\$2,302	3.74%
Back Issue Sales	Back Issue Sales	\$1,000	\$0	\$1,000	1.63%
Reprints	Reprints	\$0	\$0	\$0	0.00%
Association Support	Association Support	\$6,303	\$4,412	\$1,891	3.07%
SSHRC Grant	SSHRC Grant	\$20,237	\$20,237	\$0	0.00%
Other Funding	Other Funding	\$7,486	\$7,486	\$0	0.00%
Total		\$61,522	\$24,649	\$36,873	59.93%

Assumes: Funding support remains, Association Support declines 30% and no Subscriptions, Advertising or Back Issue sales

CASE 2

Revenues		A	B	C=A-B	D=C/SUMC
Paper	Electronic	Paper-Based Mean	E-Journ	Losses	Losses
		\$	\$	\$	%
Subscriptions	Subscriptions	\$31,679	\$9,504	\$22,176	36.05%
Advertising	Advertising	\$2,302	\$0	\$2,302	3.74%
Back Issue Sales	Back Issue Sales	\$1,000	\$0	\$1,000	1.63%
Reprints	Reprints	\$0	\$0	\$0	0.00%
Association Support	Association Support	\$6,303	\$6,303	\$0	0.00%
SSHRC Grant	SSHRC Grant	\$20,237	\$20,237	\$0	0.00%
Other Funding	Other Funding	\$7,486	\$7,486	\$0	0.00%
Total		\$61,522	\$36,044	\$25,478	41.41%

Assumes: Funding support remains, Association Support remains, 30% of subscriptions remain (Institutional), and no Advertising or Back Issue Sales

Exhibit 10: Revenue Losses to Switching to E-Journal Format (1994 data)

CASE 1

Expenses		A	B	C=A-B	D=C/SUMA
Paper	Electronic	Paper-Based Mean	E-Journ	Savings	Savings
		\$	\$	\$	%
Administration	Administration	\$17,706	\$17,706	\$0	0.00%
Editing	Editing	\$19,570	\$19,570	\$0	0.00%
Typesetting	Conversion	\$7,856	\$4,500	\$3,356	4.54%
Printing	Systems Admin.	\$18,676	\$10,000	\$8,676	11.72%
Shipping	Shipping	\$8,767	\$0	\$8,767	11.85%
Promotions	Promotions	\$1,427	\$1,427	\$0	0.00%
Total Expenses		\$74,002	\$53,203	\$20,799	28.11%

Conversion Costs: Converting Submissions to desired internet format (HTML/SGML); figures and graphs.
Assumes - 30 submissions per year @ 1 day per submission @ \$150/day

Systems Admin.: Setup, adopting new technology, managing server and account.
Assumes - 50 days per year @ \$200/day

CASE 2

Expenses		A	B	C=A-B	D=C/SUMA
Paper	Electronic	Paper-Based Mean	E-Journ	Savings	Savings
		\$	\$	\$	%
Administration	Administration	\$17,706	\$17,706	\$0	0.00%
Editing	Editing	\$19,570	\$19,570	\$0	0.00%
Typesetting	Conversion	\$7,856	\$0	\$7,856	10.62%
Printing	Systems Admin.	\$18,676	\$0	\$18,676	25.24%
Shipping	Shipping	\$8,767	\$0	\$8,767	11.85%
Promotions	Promotions	\$1,427	\$1,427	\$0	0.00%
Total Expenses		\$74,002	\$38,703	\$35,299	47.70%

Conversion Costs and Systems Admin. costs are provided free of charge by University.

Exhibit 11: Cost Savings in Switching to E-Journal Format (1994 data)

APPENDICES (TAB A)

Appendix A

Terms of Reference

Main objective:

To examine the cost and revenue structure of an appropriate sample of journals in the social sciences and humanities. This examination should be based on five paper-based journals in Canada and between three and five E-journals.

Specific tasks:

- . conduct a literature search to determine existing knowledge about the costs of scholarly publishing on paper and on-line;
- . consult with the publishers of university (or other scholarly non-profit) presses on the cost and revenue structure of academic publishing;
- . identify the major cost elements involved in the preparation of a peer-reviewed academic journal. For both paper-based and on-line journals, the examination will reveal all costs, whether they are included in the journal's expenses or paid by another source. The examination will identify which of those costs typically are paid by the journal itself.
- . identify what costs are incurred and that are not applicable to the cost structure of the other form of journal. That is, for example, the costs that are incurred by a paper-based journal that are not incurred by an on-line journal.
- . present a conclusion about the relative cost difference between the production of a paper-based journal and an on-line journal.
- . provide an estimate of the costs of production of paper based or on-line journals, provided on a per word (or other suitable unit) basis.
- . identify in the Report the typical sources of revenue for paper-based and on-line journals, including subscriptions and grants. The Report will assess the importance of subscription revenues in relation to the cost of publication, and thereby determine the vulnerability of the journal to shifts in revenues.

Appendix B

Literature Review - Sources

Advances in Library Automation and Networking
Annual Review of Information Science and Technology (ARIST)
College and Research Libraries (C&RL) Series on Scholarly Communications Database
Information Technology and Libraries
The Journal of the American Society for Information Science
Journal of Academic Librarianship
Journal of Librarianship and Information Science
Library Journal
Library Resources and Technical Services
Library Quarterly
Library Trends - especially Issue #4, Vol. 40 1992, dedicated to electronic information movement
Proceedings of the 1993 International Conference on Refereed Electronic Journals
Proceedings of the third symposium of ARL Washington November 1993
Scholarly Publishing
Serials Review
Serials Librarian

Appendix C

The Latest E-based journal on WWW - The Electronic Journal of Combinatorics

The Electronic Journal of Combinatorics is a refereed all-electronic journal that welcomes papers in all branches of discrete mathematics, including all kinds of combinatorics, graph theory, discrete algorithms, etc..

Papers can be electronically submitted in any flavor of TeX , or as PostScript files. Research articles as well as articles of more general interest are solicited. These will be published under different headings in the Journal. Refereeing of papers will be conventional, aside from being carried out via e-mail. Publication will be immediate following acceptance and filling out copyright forms.

A disk archive of the contents of the Electronic Journal of Combinatorics will be maintained by the American Mathematical Society.

Table of contents for Volume 2 of the Electronic Journal of Combinatorics:

Articles

A1: R. L. Graham and B. D. Lubachevsky, Dense Packings of Equal Disks in an Equilateral Triangle: from 22 to 34 and Beyond

PostScript versions: plain (3124 K); compressed (422K); gzipped (266K)

Abstract

LaTeX version (Caution!)

Comments

Research Papers

R1: David W. Farmer, Counting distinct zeros of the Riemann zeta-function

dvi version

PostScript version (85 K)

Abstract

AMSTeX version

Comments

R2: Aviezri S. Fraenkel and R. Jamie Simpson, How Many Squares Must a Binary Sequence Contain?

dvi version

PostScript version (135 K)

Abstract

TeX version (Caution!)

Comments

Notes

N1: Leonard H. Soicher, Yet Another Distance-Regular Graph Related to a Golay Code

dvi version

PostScript version (91 K)

Abstract

TeX version

Comments

Features

F1: C. D. Godsil, Problems in Algebraic Combinatorics

dvi version

PostScript version (174 K)

Abstract

TeX version (Caution!)

Comments [April 25, 1995]

Appendix D

Technical Issues for the Distribution of E-Journal Articles

Introduction

Journals can become "electronic" primarily through four methods: ftp retrieval, electronic mailing list, gopher site or WWW site. The methods differ both in the method of access and in the type of media handled.

FTP, or File Transfer Protocol, permits a file to be transferred from one site to another following a simple set of commands. Files usually stored as either Postscript output material or in a specific word processing format. FTP has been used as means of distributing working papers and technical reports for many years. Anonymous ftp allows a user to log in with temporary, restricted permissions.

Its primary advantage is that ftp software is very widely distributed and well understood. FTP transfer can also be facilitated using an e-mail server, gopher or WWW (discussed later). Main disadvantages include a lack of compatibility between host files and retrieval systems. It is also impossible for the information provider to set up links between documents and maintain a common distribution format.

Files may also be sent using an *electronic mailing list*. This means of distribution has always been restricted to ASCII text. However, more recent mail readers such as Eudora allow the inclusion of binary files such as graphics with regular messages. These inclusions are sent as attachments at the end of files. Mailing lists are also restricted by definition to people who know of them and those are the only people who receive the files. This is the only electronic form for e-journals discussed here that does not require that a recipient be directly connected to the Internet.

Gopher is a menu-based information retrieval service originally developed at the University of Minnesota. It experienced explosive growth in the early 1990's but was primarily useful for ASCII based files. This restriction (in spite of modifications to include other media) has led many information providers to move their sites to a World-Wide Web site.

The *World Wide Web* (WWW) connects information providers using links between different documents, called hyperlinks. All information on the WWW is coded in HTML (hyper-text markup language) documents. It is possible to display, transfer and save text, graphics, sound and even movies using this protocol. Like Gopher, WWW is based on a client-server architecture where each information user is a client and the information provider is a server.

For the purpose of supporting an e-journal, a WWW server is the best route. Articles stored in this format can incorporate text and graphics just as paper-based journals do. Additionally, authors can attach links to supplementary documents at their home sites to provide such items as raw data or computer programs for ftp download or direct e-mail contact addresses. An editor can link documents, provide e-mail links to article authors and accept feedback concerning articles and journal management.

WWW

Information provider servers can be set up on any computer platform (such as UNIX, PC or Macintosh) provided that it is directly connected to the Internet. Information is stored simply as a set of files. Client software is available for most computer platforms. Table 1 shows popular WWW clients. The clients are all public domain software with the exception of Netscape which is commercially supported. Netscape is available to educational and not-for-profit institutions *but not government* free of charge. Agora permits sites that are not directly connected to the Internet to access Web information via e-mail, provided that the recipient knows the URL. At this time the dominant Web browser is Netscape and the most common platform is Windows.

Platform	Program
E-mail	Agora
Terminal	Emacs Lynx
Windows	Cello Mosaic Netscape WinWeb
Macintosh	Mosaic MacWeb Netscape
X-Windows	Mosaic Netscape
NeXTStep	OmniWeb
VM	Albert

Table 1: Popular WWW Browsers

Documents are identified on WWW using a Universal Resource Locator (URL). A URL indicates the type of hyperlink. The most common are *http* to HTML documents, *mailto* for an e-mail connection and *ftp* to download a file.

Electronic Journals

There are many electronic journals on the WWW at this time. A list of e-journals on WWW is being collected at CERN High-Energy Physics Lab in Switzerland. The URL for this resource is <http://info.cern.ch/hypertext/DataSources/bySubject/Overview.html>. This site also maintains a list of peer-reviewed journals. Once a journal is located in this directory, it is easily and immediately accessible to readers around the world.

HTML Files

HTML is the formatting language for documents on the WWW. Standards are being developed that permit any of the client programs to read the documents. The current accepted standard is HTML 2.0 while HTML 3.0 is under development.

In order to make e-journal articles accessible to readers, Postscript files may be linked as an ftp connection. Word processing documents in formats such as Word and WordPerfect must be converted to HTML formats before being made accessible on the Web. The next section discusses the conversion of most word processing file formats to HTML file format.

Word Processing Filters

Most current word processing packages are capable of generating output in Rich Text Format (RTF). RTF was developed by Microsoft in order to facilitate the transfer of files between word processing packages. RTF files can incorporate graphics such as in-line equations and figures. Specifications for RTF can be obtained from [*ftp://ftp.primate.wisc.edu/pub/RTF*](ftp://ftp.primate.wisc.edu/pub/RTF)¹.

In order to maximize the convertibility of a word processing file to RTF, style sheets must be utilized. Style sheets are being used more frequently but not universally. However, it would not be difficult for an e-journal to develop style sheets for major word processing packages that would be available for downloading.

Since most word processing packages can export RTF files (as well as programs such as Framemaker and PowerPoint), it would be sensible for the management of an e-journal to take word processing files that have been prepared on-line with a style sheet and convert them to an RTF file. The RTF file can then be translated into an HTML document using a program such as rfttohtml. This conversion program is available for Unix, Macintosh, Dos and OS/2 operating systems.

La_TeX is a document processing package used heavily in science, engineering and mathematics. Conversion programs specifically for La_TeX have been designed that removes the need for an intermediate transfer to RTF.

It is also possible to author HTML documents directly in Word, WordPerfect or other packages. Utility packages exist that simplify this task. An e-journal could also make these utility programs directly available to authors and have them write and format their articles directly as HTML documents. Forms (a feature of HTML that allows user input) could then be inserted by the editor to facilitate comments and suggestions directly from referees.

A list of tools that can be used for converting, authoring and modifying HTML documents is maintained at [*http://www.w3.org/hypertext/WWW/Tools*](http://www.w3.org/hypertext/WWW/Tools).

¹ *Meaning of this URL: ftp:// means that this is an ftp transfer link, ftp.primate.wisc.edu is the site and /pub/RTF is the directory. After the user would connect to this link, a directory of files that are available for downloading would be presented.*

Implementation

The following steps must be taken in order to implement a WWW information site:

- a) secure a server connected directly to the Internet
- b) decide what information will be provided
- c) undergo training in authoring WWW documents
- d) decide if authors will submit articles in HTML format or word processing format.
- e) develop style guidelines and style sheets if necessary.

With respect to d, it will be easier for the maintenance of the e-journal if articles are submitted in HTML format. However, this will likely cause user resistance and may adversely affect the quality of submissions.

If the articles are submitted in a commercial word processing format, they must be converted into HTML format using the guidelines previously outlined. In order to facilitate this step, styles using appropriate labels must be used. These styles are now standard for current versions of word processing packages but not, for instance, WordPerfect 5.1. Additional processing would be required for such files, likely conversion to Word 6 or WordPerfect 6.1.

If articles are being submitted in HTML format, the E-journal editor can make additional modifications as desired. Examples would be addition of e-mail addresses, direct links to previous articles that are referenced or cross-references between articles that form a special or theme issue of a journal.

**APPENDIX E:
SELECTED PAPER JOURNALS (SOCIAL SCIENCES AND HUMANITIES)**

- JOURNAL A:** Peer-reviewed quarterly. Circulation of 1450 (60% Canadian), with an average press run of 1700. The average issue has 180 pages. Prices range from \$15 to \$45 and includes a small discount for association subscribers. There is more than one supporting association but these provide little direct funding. Advertising rates are approximately \$200 per page.
- JOURNAL C:** Peer-reviewed biannual. 250 subscribers and an average press run of 300. 150 pages each for two issues per volume. Prices range from \$14 to \$30. There are no supporting associations. Advertising is by contra arrangement.
- JOURNAL D:** Peer-reviewed quarterly. There is a circulation of 1200, comprising 900 association members and 300 additional subscribers. Prices range from \$80 to \$150, with a \$20 discount for members. Full page advertisements sell for \$300.
- JOURNAL E:** Peer-reviewed quarterly. There is a circulation of 800 and an average press run of 1100. Association member subscription is indirect - the association pays the journal on a per member basis out of membership dues and members receive the journal automatically.
- JOURNAL F:** Peer-reviewed quarterly. Subscribers number 2500 (85% domestic) with an overall press run of 4000. Prices range from \$24 to \$50. There are no association membership subscriptions and the supporting association does not provide funding. Ad rates are not available.

**APPENDIX F:
Verbatim Responses -
Structured Interviews with 5 Canadian Electronic Academic Journals**

PEER REVIEWED?:

E-Journal A: Refereed
E-Journal B: Yes
E-Journal C: Yes
E-Journal D: Yes
E-Journal E: Yes

YEAR OF STARTUP:

E-Journal A: 1993
E-Journal B: 1995 (APR)
E-Journal C: 1996 (call for papers Aug 1995)
E-Journal D: 1995 (MAY)
E-Journal E: 1991

CONCURRENT WITH PAPER JOURNAL?:

E-Journal A: No
E-Journal B: No
E-Journal C: No
E-Journal D: No
E-Journal E: No

PRIOR PAPER JOURNAL?:

E-Journal A: Yes (15 years until 1992)
E-Journal B: No
E-Journal C: No
E-Journal D: No
E-Journal E: No

INTERNET INTERFACE:

E-Journal A: WWW Site (through donated US University server), E-Mail (articles)

E-Journal B: WWW Site (University server), Gopher ,E-Mail

E-Journal C: WWW Site (University),Gopher, E-Mail, FTP (for custom software download only)

E-Journal D: E-Mail (Listserv)

E-Journal E: final decision pending

CONVERSION/FORMAT:

E-Journal A: WWW - HTML/ Pagemaker layout for each collected issue
E-Mail- ascii

E-Journal B: WWW - HTML, Gopher - ascii, E-Mail - ascii

E-Journal C: HTML, soon to be SGML

E-Journal D: ascii (format could be improved)

E-Journal E: FTP site, usenet, Gopher (recently removed by host University for overall system maintenance reasons), will have WWW site

OPERATING SYSTEM PLATFORMS SUPPORTED:

E-Journal A: DOS, Mac, UNIX

E-Journal B: DOS, Mac, all

E-Journal C: DOS, Mac, UNIX

E-Journal D: DOS, Mac, UNIX

E-Journal E: Modified Text (filed encoded for French accents: MS-Word, WP5.1, ascii) - but inconsistent pagination, must hard-code page numbers for reference Pictures as separate files (see below), Going to RTF, Now HTML, step to WWW and handling of bilingual text, Goal: analogous presentation with paper

ARCHIVING:

E-Journal A: University Microfilms Inc. - CD-ROM (Royalties), Server

E-Journal B: Server & Mirror Site at University, Standalone PC, National Library of Canada (primary)

E-Journal C: will be Server & CD ROM, looking at mirror site

E-Journal D: Server only for now

E-Journal E: Mirror Sites internationally, Diskette, CD ROM, Hard copy to National Library of Canada

NUMBER OF ISSUES PER YEAR (IF PACKAGED):

E-Journal A: Twice per year (biannual?) , Issues pending can be viewed through e-mail

E-Journal B: Quarterly packaged with Table of Contents, T of C released in ascii, "Forthcoming" articles accessed via WWW

E-Journal C: Quarterly packaged, Sub menu of articles available through email

E-Journal D: Expect 10-12 this year, 1 article and any commissioned responses will constitute an issue, ongoing

E-Journal E: Annual Volume, each article/review published as an issue# when ready, Will allow authors to update articles (e.g. v1, no.1.2), Averaging 18-20 per annum, expect 40 in 1995

ARTICLES PER ISSUE (Articles, Reviews, etc.):

- E-Journal A: 20 (articles, reviews, interviews)
- E-Journal B: 10 - 15 (articles, reviews)
- E-Journal C: To be determined, but 30 in similar paper journals
- E-Journal D: 1 + commissioned responses (2 max.)
- E-Journal E: 1

EQUIVALENT # OF QUARTERLY JOURNAL PAGES:

- E-Journal A: 150 pages per issue, 300 per year
- E-Journal B: 200 pages per qtr
- E-Journal C: tbd
- E-Journal D: 80 - 100 per annum
- E-Journal E: 360 - 500 per annum, 90 - 125 per quarter.

SUBMISSION REJECT RATE:

- E-Journal A: 10-15%
- E-Journal B: 66% so far (early)
- E-Journal C: to be determined, will accept all that pass peer review
- E-Journal D: 50% so far (2 of first 4 accepted with revisions)
- E-Journal E: Low reject rate (10% at worst), since trying to get articles published. Expect 1/3 reject in future

USE OF GRAPHS/TABLES:

- E-Journal A: Have used pictures, including movement
- E-Journal B: Capable in HTML version, but not yet required
- E-Journal C: Yes
- E-Journal D: No
- E-Journal E: Little need (none yet). Will accept pictures and publish as separately referenced .tif files, so that reader can download as desired.

SUBMISSION PROCEDURES

- E-Journal A: Email, diskette, hard copy (most through internet in ascii)
- E-Journal B: Paper OK with an electronic product ascii text format with stylistic requirements for word, wp, dos, mac
- E-Journal C: Data not available
- E-Journal D: Data not available
- E-Journal E: allows for all formats of inputs, including paper (common in 3rd world). Prefer e-mail or diskette. Rework formats, but goal is to streamline this process. Paper submissions scanned - OCR. Accept page lengths of up to 70 pages, but finding authors self-censor to custom of 20-25 pages.

HANDLING OF SUBSCRIPTIONS/REVS/FUNDING:

- E-Journal A: free, although royalties on reprints, \$75 per mo. from Swedish newspaper
- E-Journal B: free access, small operating grant, University donated resources
- E-Journal C: free access. Rely on grants for support of state-of-the-art journal from foundations other sources, Will sell CD ROM archives

E-Journal D: free access

E-Journal E: free access. donated time and resources as well as some significant funding to support e-journal project

NUMBER OF READERS/SUBSCRIBERS

E-Journal A: 100 subscribe to ascii disk version, 2500 "hits"

E-Journal B: 300 per mo. before first issue available; 600 "hits" since Apr. 30., 175 email subscribers, expect 200

E-Journal C: not applicable

E-Journal D: 200 subscription list so far

E-Journal E: Thousands of "hits", from all over the world. Journal is being "mirrored" internationally now.

SETUP:

E-Journal A: It took 9 months to set up our journal. The key was finding a good listserv manager.

E-Journal B: 1 year. Basically needed a viability check and development of a solid editorial board (key).

E-Journal C: \$150,000 one year start-up supported by foundation/other grants for state-of-the-art journal. 2 years to start, 1 year Full Time. Includes 1 FT Systems Admin. person developing custom software to be downloaded for free use in submitting standard articles

E-Journal D: n/a

E-Journal E: n/a

ONGOING:

E-Journal A: People: 2 co-editors (several days/week), and 1 listserv manager (3 days/week) Co-editors donate time, listserv manager hired by University

Listsrv manager - put material on-line, handle system "glitches", queries, publish on pagemaker twice a year, liaison with University, National Archives. Has tech skills and people skills, some knowledge of subject area is bonus.

WWW site manager donated time, 1-2 days per week (varied).

Univ. donated server and Web site. 2 Computers provided by editors at no charge

Existing office space , Dedicated Fibreoptic line from University - bonus.

Only mailing costs are articles for referee process.

Commercial publisher savings more than outweigh lost revenues.

No longer need SSHRC grant. Articles more timely and editors have more time to spend on "intellectual" roles.

E-Journal B: 3 computers (2 macs, 1 pc) shared resource with dept. (from Provincial grant)
Univ. server, Univ. Library is archiving, No mailing, peer review by internet.

Time donated, no one full time. Est.: 3 hours each x 6 people = 9 hours per week.

People: 1 library liaison (site maintenance)
1 system admin. (maint. docs, up/down load)
1 Edit. Asst. (in touch with subscribers, email queries, review process)
2 Page Developers (page by page links - html tracking new references, 1 manages value-added links to related resources, and "interactive journal" project) ** could manage basic with 1.

1 Editor

Could do basic journal with 5 people x 2 hours = 10 hours per wk — again, donated time, many work from home, own PCs.

Est.: 50/50 split between tech and edit functions

E-Journal C: \$30,000 per annum for: Managing Ed, Copy Ed. (PT), Systems Admin. (PT) (ongoing development, state-of-art updating)

Only email submissions, eliminates paper, mailing in peer rev.

Basic Journal:

ditor-In-Chief - overall guidance

Managing Editor - peer review process

Systems Admin. - handling subscribers lists, public directories, WEB pages, UNIX accounts (1 day per week)

Copy Editor (up to 1/2 day per submission) - input, links, figures, conversions, and standard copy ed. checking of submission

1 Server, 1 Mac, 1 DOS machine (although may be able to get by with one machine and Mac/DOS conversion software)

E-Journal D: Have been able to operate without cash expense so far. Have received grants for RA support.

Listserv handled by Univ. computing services

RA provides 4 hours / week in technical support in producing journal (paid for by \$2500 per annum grant)

Editorial Bd. donates time (and own PCs)

No new space, existing machines (1 Mac, 1 PC linked by LAN)

E-Journal E: Basic Journal would need server, but often can get Univ. account and support. If autonomous, use Pentium PC as server. Est. need for only 1 - 1.5 MB disk space per year (15 over 10 years of archives).

Equipment to treat text to enable to be uploaded. 2 Machines (1 DOS, 1 Mac), Free software on internet

Editor

System Support (Univ. or RAs (good win-win situation, use skilled support and use grant funding). 1 day/wk min., most work would be in system evolution, only 100 uploads per year for journal.

In general, good opportunity for grad. assistantships.

1 room, furniture, 1 phone, 1 answering machine (although, could be home-based)

Endnotes:

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- i. Standera (1985), Lorimer (1985).
 - ii. The Faculty Electronic Research Centre (FERC) established at the University of California allows the faculty an on-line access to over 14,000 periodicals (soon to be extended to 20,000+). Faculty members can search for articles electronically and place an electronic order for 24 hour fax delivery. The library is then charged \$6.50 per article plus a variable copyright fee. This service allows the library to discontinue certain periodical subscriptions, while still allowing faculty to receive any paper that they wish to read. Thus this is a hybrid form - providing electronic access to paper-based journals (Rankin, 1994).

The Red Sage project is a collaborative project currently underway at University of California, San Francisco which uses Rightpages, a trademark software. Its objectives are three-fold: (1) to explore the technical/behavioral issues associated with the electronic delivery of primary journals to scientists at their desk; (2) to gain an understanding of how Springer (the publisher collaborator) needs to modify their print production processes to produce electronic versions of their journals efficiently; (3) to understand and quantify the significant business and marketing issues associated with the electronic delivery of journals (Lucier and Badger, 1994).

The Study of Electronic Literature for Astrophysics Research (STELAR) experiment is exploring what is required to bring the astrophysics literature on-line (Van Steenberg, 1994).

- iii. URL: [HTTP://ejc.math.gatech.edu:8080/Journal/journalhome.html](http://ejc.math.gatech.edu:8080/Journal/journalhome.html)
- iv. In the literature, this copy editing step is sometimes included in the 'first copy' phase. As will be seen later, we consider it as a cost incurred in the second phase since it is associated with the after-acceptance step.
- v. In the case of the journal in the last column in exhibit 9, some of the typesetting costs actually belong in the printing costs; the exact breakdown was unavailable.
- vi. The cost of paper has risen recently. For example, a box of bond (500 sheets) cost \$28 in March 1995, rose to \$46.35 in April, and on May 15, the price hit \$52.20. As will be seen later, this increase in paper price is bound to affect costs of printing.
- vii. There are indications that these costs would increase. For example, in the recent 1995 budget (p.44, Budget document), the federal government announced that postal subsidies would reduce by 8 percent over three years; the exact impact of this reduction on the postage rates for academic journal is unclear.
- viii. It can be argued that the individual subscription fee is also supported by funding agencies since many academics charge these fees to their research grants.

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 Cost and revenue structure o

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