E-Journal User Study
Report of the Second Survey: The Feature User Survey
November 2002

I. Introduction and Overview

Electronic journals, or e-journals, have become an important tool for scientists and medical practitioners over the last few years. As Tenopir and King (2001a) have noted, nearly two-thirds of all scientific journals are available both electronically and in print, and there are more than 1,000 electronic-only peer-reviewed journals. The overall goal of the E-Journal User Study is to understand the broad range of value that all of this electronic publishing adds for scholars across a range of scholarly activities, including reading, writing, searching the literature, and creative thinking. Through both qualitative and quantitative research,[1] we are examining how life scientists and medical practitioners are making e-journals a key part of their scholarly practice. Our research provides a foundation of data and analysis that we hope will help publishers, libraries, and other scholarly institutions develop more useful e-journals and electronic publishing services.

The Second Survey: The Feature User Survey

In our first survey, we investigated patterns of scholarly practice among users of e-journals in the life sciences (the full report on the first survey can be found on the study website at http://ejust.stanford.edu). This report presents the findings from our second survey, the Feature User Survey.[2] In this second survey, we looked at the practices of more sophisticated users of journals—those who use at least some of the multiple features available through electronic journal editions. (We refer to these users as "feature users".) We investigated which e-journal features and services are most useful to these more sophisticated feature users worldwide, how and why these users use various e-journal features and services, what problems they encountered with the features, and how they make decisions about personal journal subscriptions (compared to institutional access). We also conducted a third survey, of a subgroup of respondents from the first survey; the full report summarizing the third survey findings will be available on the study website in January 2003.

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[1] Research tools were ethnographic interviews, expert workshops, expert interviews, data mining, and three large surveys. See *www.ejust.stanford.edu* for the findings of each of these pieces of the project as they are completed.

[2] Feature users of e-journals are those who are most familiar with e-journals. This study used one online feature, an e-mail alert service, to measure the familiarity of users with e-journals. We define those who signed up for e-mail alert services—such as e-mail Table of Contents (eTOCs) and e-mail citation alerts—as feature users of e-journals. Note that our second survey has a different target population than our first survey did, and thus the two samples are not directly comparable. The second survey sample is more homogeneous in e-journal usage than was the first survey sample, because it includes only feature users, whereas the first survey sample contained nonusers, basic users, and feature users.

Several other researchers have recently used surveys to study the use of e-journal features by scholars (see, for example, Eason, Yu and Harker 2000; Liew, Foo, and Chennupati 2000; Rusch-Feja and Siebeky 1999; and Brown 1999). Eason, Yu, and Harker surveyed a subset of the 2,867 academic users of SuperJournal, a two-year test e-journal service in the United Kingdom. Liew, Foo, and Chennupati surveyed 83 U.S. graduate students about their interaction with PROPIE, a mock e-journal platform. Rusch-Feja and Siebeky report on the initial results from a survey of 1,042 German researchers (mostly in biomedicine and the physical sciences) from the Max Planck Society.

Implemented in November and December 2001, our Feature User Survey collected information about the feature usage of a larger and more international population of users: of 10,086 life scientists and medical practitioners from around the world who use the e-mail alerting features (moving beyond full-text article access) of thirty-nine society-published e-journals.

The findings paint a picture of some of the evolving functions of e-journals in scholarly practice. In sharing these findings with the public, with users, with publishers, and with libraries, we hope to help inform journal development and to provide actionable implications for e-journal design, new feature development, and new business and service models.

Objectives of the Second Survey

The primary objective of the Feature User Survey was to investigate usage behaviors and preferences of feature users regarding a variety of e-journal features. Specifically, the goal was to measure:

- current usage of e-journal features
- problems users encounter with features
- the searching behaviors of e-journal users
- reading preferences of e-journal users
- subscription-related behaviors of e-journal users

Research Questions

The survey was designed to answer the following research questions:

Which online features do feature users employ and find the most useful? For features they have not previously used, which would they be willing to try?
- Do medical doctors and research biologists differ in their use of online features? Do academic researchers differ from nonacademic researchers?
- How problematic to feature users are various known difficulties in the electronic environment, such as difficulties with display formats (PDF and HTML) and with lack of links to older issues and cited articles?

- Why do scholars use e-mail alert services, and how useful are they (especially given the increase in "spam")? Do users act on the alerts rather than just saving or deleting them?
- How do feature users search online? Could search engines be improved to address the search-related frustrations of users? Do users examine more than one screen of search results?
- How do feature users take advantage of the pay-per-view feature, and how much are they willing to pay to read an article?
- In what formats (PDF, HTML, printed copy) do feature users prefer to read articles and view images? Do feature users read and/or scan articles retrieved online on the screen before printing them out?
- How many journals do feature users read and browse at a given point in time? Do high-volume readers have different preferences for reading format than low-volume readers?
- Why do feature users pay for personal subscriptions and society memberships?
- Why do feature users subscribe to new journals or cancel subscriptions to existing journals, and how does the availability of online editions affect these decisions? Do feature users cancel personal journal subscriptions because libraries provide institutional access to online versions of the journals?

In answering these questions, this report begins to illuminate the value (beyond full-text retrieval) added by e-journals to scholarly practice. The findings of the Feature User Survey suggest paths for developing future online-specific features, improving e-journal features, and marketing e-publishing.

We will describe the sample and the sampling methods of the survey in section II, present the findings in section III, discuss the findings in section IV, and suggest possible implications in section V.

II. Sampling Methodology and Sample Description

The target population for the Feature User Survey consisted of life scientists and medical practitioners who are relatively familiar with using e-journal features (referred to as "feature users"). We used e-mail alert service usage as an indicator of relative familiarity with e-journals and assumed that users of alert services would be more likely to use other types of features as well. We asked these respondents about their usage of and problems with online features currently available in e-journals. Because of their more intensive use of e-journals, these respondents were able to comment thoughtfully about problems of, frustrations with, benefits of, and potential improvements to e-journals and various features. Descriptions of the sampling methods follow. The final usable sample size was 10,086.

Sampling Methodology

The second survey was conducted online in the same manner as the first survey.

Sample design: Thirty-nine society-published scientific and medical journals participated in the second survey (see Appendix III). We obtained e-mail addresses from the list of current electronic Table of Contents (eTOC) service subscribers for each journal. These journals provide their eTOC services free to everyone. The people solicited, therefore, are not necessarily members of societies or those otherwise privileged with online subscriptions. The services send e-mail alerts to service subscribers when new Tables of Contents are available for the journal.

Online questionnaire: The questionnaire may be viewed at http://ejust.stanford.edu/usersurvey2-linked.htm (although it is not active for data collection). Note that the second survey questionnaire contains many open-ended question boxes, whereas the first survey did not. (We did, however, receive about 200 unsolicited feedback letters from respondents to the first survey.)

Solicitation methods: We sent 83,925 e-mail solicitations to eTOC subscribers, requesting that they respond via the questionnaire on the Web. From this group, 7,621 solicitations were returned "undeliverable" or with "technical errors," resulting in a contact group of 76,304.

Survey implementation and data collection period: Survey solicitations were sent out between November 26 and November 28, 2001. Data were collected between November 26 and December 21, 2001.

Survey response rate: 10,086 unique responses were received during the data collection period, resulting in a survey response rate of 13.2% of the contact group.

Descriptive Statistics for Selected Demographics

The survey collected information, summarized here, on demographic factors—sex, occupation, affiliated organizations, age, field of research, and country of residence. See Appendix I for more detailed descriptive statistics.

Sex: Of the respondents, 67% were male and 33% female. (There were 9,885 responses to the question about sex; 201 responses were missing.)

Occupation: Of the respondents, 26% were health professionals (with 80% of these health professionals being medical doctors such as physicians or radiologists), 19% were faculty members in academic institutions, 19% were research scientists, 16% were students, 16% were postdoctoral researchers, and 4% were retirees or others.

Affiliated organizations: Of the respondents, 67% were affiliated with academic institutions, and 23% were with hospitals affiliated with universities. Other organizational affiliations reported were for-profit companies (9%), government organizations (6%), hospitals or clinics not affiliated with a university (5%), nongovernmental nonprofit organizations (2%), and self-employed individuals (0.03%). (Percentages add to more than 100% because respondents were allowed to check all affiliations that applied to them.)

Age: The average (mean) age of the respondents was 39; the median age was 37. Of the respondents, 63% were between ages 31 and 50, 24% were younger than age 31, and 14% were older than age 50.

Fields of research: Of the respondents, 39% reported their research field as biological sciences, 33% as medicine, 19% as biomedical research, and 10% as agricultural and other research fields related to life sciences. (For more detailed breakdowns of the respondents' fields, see Appendix II, Question 26.)

Country of residence: Respondents were from 126 different countries: 42% resided in the United States and Canada, 39% in European countries, 8% in Asia, 5% in Australia, 4% in Latin America, and less than 1% in Africa.

III. Findings

The Use and Usefulness of Online Journal Features

Literature Review

The SuperJournal Project, sponsored by the United Kingdom's eLIB program from 1997 to 1999, conducted the most comprehensive previous survey on feature use (Eason, Yu, and Harker 2000). That project found that users of the test SuperJournal site perceived browsing, searching, and printing features to be the core features of e-journals but also considered customizing features—such as alerting, saving references, building virtual file boxes of articles, and annotating articles—as "nice to have." Respondents had a mixed opinion about linking features; they considered links from bibliographic citations to the actual article or abstract to be "nice to have" but expressed particular interest in links to the Web sites of authors and to the previous articles of authors.

Although our survey did not compare the core features of browsing, searching for, and printing full-text articles with more recent value-added features, our findings about the usage and usefulness of online-specific features (see Table 1) are mostly consistent with the SuperJournal Project findings. Our findings about linking features, however, contrast somewhat; more of our respondents noted that they used and found useful links to cited articles than noted that they valued links to authors' Web sites. (We did not ask about links to authors' previous articles.) This may be partly because cross-reference links to cited articles were much more available in the timeframe of our survey than in the timeframe of the SuperJournal survey. As we discuss here, hyperlinking is emerging as perhaps the most useful and important of all the value-added features currently available.

Another eLIB project, the Open Journal project, looked extensively at linking features (Hitchcock, Carr, Hall, Harris, Probets, Evans, and Brailsford 1998). The Open Journal project developed a linking system in which links are published within documents upon delivery and served by a link service via a proxy server. This system allows for continual updating of citation links, so that users may be pointed not only backward to earlier works (as in print journals) but also forward in time to later papers citing the one being viewed. The project also experimented with keyword linking and PDF linking.

CrossRef, a collaborative DOI-based linking service venture (initially among 12 top scientific publishers, now among 70) may represent the future of linking features. CrossRef, now about two years old, had in 2001 more than 3 million records from 3,875 journals and was on track to add between 500,000 and 1 million new records per year. The DOI Handle System resolved about 400,000 CrossRef clicks per month in 2001—indicating that many scientists are already experiencing the ability to link from a citation in an article to the full text of that article at another publisher's Web site.

Some previous literature also exists about the least-used feature in our survey: pay-per-view. A survey of 252 U.K. academic and nonacademic scientists (in the life sciences, medicine, hard sciences, and social sciences), conducted by the Ingenta Institute and reported by Worlock (2002), found that nearly half had ordered full-text pay-per-view articles (whether paid for personally or by their institution) and that nearly 30% had at some point paid for full-text articles personally. Because our survey did not specify whether the respondent or the respondent's institution had paid for the pay-per-view feature (used by 36% of the respondents and found useful by only 33% of those who used it), it is difficult to compare the U.K. users to the broader sample of our survey on this item. (See also the section on "Pay-Per-View Features," following, for more background data.)

Most of the other features we asked about in our survey have not, to our knowledge, been asked about in previously published surveys. A prototype online peer-review feature (a discussion whiteboard) was included in the SuperJournal test project but not used much.

Table 1: Use and Usefulness of Online-Specific Features

Online-Specific Features	Proportion Used (%)	Proportion Useful (%)
Links to a cited article in the same journal	87	98
Toll-free links to a cited article in a different journal for no charge	76	99
Links to a scientific database	63	94
Access to articles "in press" (links to articles that have been peer reviewed/accepted but not yet edited)	63	86
Links to author's e-mail address	61	85
Electronic manuscript submission	60	95
Links to author's Web site	52	81
Online peer reviews	49	96
Videos or animated graphics	45	67
Pay-per-view features (access to a single article immediately following online payment)	36	33

Topline Findings

Feature users benefit from a range of useful features beyond full-text retrieval.

Have e-journals succeeded in adding online value other than full-text retrieval for scholarly practices? The data from our survey show that 77% of feature users do indeed use these features to stay current in their own fields; 60% use institutional online subscriptions, and 12% use personal online subscriptions (see Appendix II, Question 11). The data in Table 1 clearly answer our research question about the use of features beyond full-text retrieval: nearly all of the features were used by 50% or more of our respondents.

Hyperlinking features are the most used and useful features.

The most used and useful features are all related to hyperlinks, suggesting the importance and benefit of online navigation features, both for connection with other kinds of content and for connection with scholars themselves. More than 75% of our respondents had used hyperlinks to cited articles (within or across journals) and had found them to be useful. Moreover, 98% of those who had ever used hyperlinks to cited articles had found hyperlinks to cited articles within the same journals useful, and 85% had found hyperlinks to citations across journals useful.

Medical doctors favored hyperlinks to cited articles more than did non-medical doctors (91% versus 85%). The context of information usage and specific working environments may explain this. Medical doctors may be more restricted physically, for example, unable to afford to leave clinics to visit libraries (and possibly less likely to have libraries available nearby).

Hyperlinking to scientific databases was also a popular feature (among 59% of the sample), followed by hyperlinking to authors' e-mail addresses (52%) and to authors' Web sites (42%). Those who used hyperlinks to authors' Web sites were positively correlated to those who used hyperlinks to authors' e-mail addresses (with a correlation of about 0.6). Of those who used authors' Web site links, 83% also used authors' e-mail address links.

Most of those who used online manuscript submission and online peer review found these features useful (95% and 96% respectively). Because these features help to speed up processes of submission and review, they should appeal most to those with established careers who publish many papers and have many papers to review.

Respondents had not used videos or animated graphics, but respectable numbers of feature users are interested in trying these features.

Although survey respondents had not much used video or animated graphics, these users were willing to try these features. Of the respondents, 27% would like to try video or animated graphics, although they had not used them yet; only 31% had used these graphics and found them useful. Video and animated graphics features are in an early stage (only 45% of feature users had ever used

them) and need improvement relative to other features (31% of users of these features found them *not* useful). Medical doctors use videos and graphics slightly more than do other research scientists (50% of MD respondents had used these features, whereas 42% of non-MDs had used them; 27% of non-MDs answered that they had never tried them but would like to try them). Video and animated graphics features clearly need more development and possibly better marketing, particularly in journals targeted at non-MDs.

U.S. and Canadian scholars are more likely than scholars from Africa, Asia, Australia, Europe, or Latin America to have used any given online feature.

U.S. and Canadian scholars were more likely to have used most online features we asked about than were scholars from other countries. This finding seems counterintuitive if one assumes that library space and collections are more restricted outside of the United States and Canada and that scholars in other places might thus turn more frequently to online features, particularly to retrieve hyperlinked articles in citation lists. Interestingly, responses to an open-ended question in our survey about feature use suggest that respondents from developing countries (e.g., Argentina) may value e-journals and alert services highly because they allow access to articles that users would otherwise not have access to at all, especially to journals that provide free online access. It is not clear why this value does not translate into higher usage of other value-added online features, unless perhaps poor computer infrastructure (e.g., slower download speeds) makes using these features too cumbersome.

The prepress feature is slightly more popular among biologists than among other researchers, particularly medical researchers.

Sixty-five percent (65%) of biologists have used the prepress feature and found it useful, versus 48% of medical researchers. This suggests that biology is a faster-moving field than other life sciences in the study. It seems important for biologists to obtain information as soon as it is available.

Feature users use pay-per-view less than they use other features.
Pay-per-view was the least popular feature, with 53% of the respondents never having used it or planning to use it. Only 12% of the respondents had used it and found it useful. These 12% were willing to pay somewhat more per article than the average for the sample (about $2 more per article). See also the section on "Pay-Per-View Features," following, for more data on motivation to use pay-per-view and on the price difference between what feature users are willing to pay and the current price of pay-per-view.

Alert Services

Literature Review

Alert services have become popular only in the last few years, so there are currently few studies of their use. Tenopir and King (Tenopir 2000) found that alert services were used to locate only a small percentage of articles read by scientists between 1993 and 1998. Other methods of identifying articles to read included browsing of bound volumes (62% of articles read), online searches (12%), other people (11%), and citations found in other articles or books (9%). Other means of identifying articles, including alert services and printed indexes, totaled only 6% of all readings.

Our survey did not collect information about the number of readings, nor did it target the average scientist, so we cannot compare our data to these figures. Our sample contains only those scientists who do use alert services currently, and thus our data help to illuminate the motivations for using such services, as discussed here.

Topline Findings

The top five reasons for signing up with alert services were

1. to become aware of articles published in a given field (9,780 responses)
2. to scan more journals than time would otherwise allow (7,587 responses)
3. to obtain knowledge of new research/practice as early as the information is available (7,365 responses)
4. to keep up to date with trends in science and/or in other medical practice (7,124 responses)
5. to reduce library visits (7,025 responses)

Note that we asked respondents to check *all* the reasons they had for signing up for alert services.

Alert services clearly help users to stay current in their own fields. As discussed in more detail following, alerts also seem to bring the user many other advantages, such as the ability to save time and effort, obtain information sooner, and be able to keep up with more journals. Most respondents do read the articles they receive alerts about, and most also have easy access to those articles through institutional subscriptions. These findings suggest that alert services may be powerful attractors for online journal usage.

Alert services help users to stay current.

The main reason respondents checked for signing up for e-mail alert service was to stay current in their own fields (97% checked this reason). E-mail alerts help scientists and practitioners to keep up-to-date, save time for information retrieval, and—a particularly interesting motivation—help scan more journals than respondents otherwise would read (75% checked this reason). E-mail alerts thus help users to cover more journals with much less effort.

The survey asked about two specific e-mail alert services: (1) general Table of Contents alerts, sent when new journal issues are available, and (2) citation alerts, sent to alert readers of specific articles of possible interest. More specialized alert services, such as keyword and topic alerts, are also being developed. Despite current frustrations with "spam," e-mail alert services seem to be useful for scholarly practices.

Most feature users have access through institutional subscriptions to full-text articles mentioned in e-mail alerts.

Of feature users, 72% have access to the full text of the articles mentioned through institutional subscriptions and 14% have access through personal subscriptions; nearly 13% of those signed up for e-mail alerts, however, have no online access to the journal articles for which they receive alerts. feature users from outside of academia and from outside of the United States and Canada are less likely to have institutional online access than those affiliated with academia and those from the United States and Canada.

Feature users overall rely heavily on institutional online access for retrieving full-text articles received by alerts. Many online features developed by individual publishers (such as e-mail alerts) can most easily be used with library subscriptions to online journals. Despite current conflicts between libraries and publishers, this result indicates that e-publishing may flourish, along with library services to the community.

Most respondents follow up on articles about which they receive e-mail alerts.

Most respondents (98.5%) follow up on the articles (either abstracts or full text) about which they receive e-mail alerts. Seventy-four percent (74%) read abstracts first, and 21% read full-text articles without reading abstracts as a first step in following up on articles from e-mail alerts. E-mail alerts may thus be effective tools for helping scholars to identify relevant content and then screen it (either by reading the abstract or by linking directly to the full text) to see if they want to read it in more detail.

Related Findings from Open-Ended Questions

Respondents were given the opportunity to add (in free-text comment boxes) any other reasons they had for using e-mail alerts or to note benefits they received from using alerts. Typical benefits included time and cost savings (presuming the articles were free) and the convenience of not having to go to the library or somewhere else to get an article. Another benefit not listed as a survey choice was that e-mail alerts facilitate selective article printing, reducing the huge amounts of paper to be read.

Perhaps the most interesting benefit mentioned in the open-ended responses was that e-mail alerts preserve a schedule or routine for scanning that the scholar does not have to maintain. Several scholars mentioned that they do not need to keep track of when to scan or browse certain journals

because they know that they will get an e-mail alert. They made statements such as "I don't have to remember" or "I don't have to think" about looking in particular journals because they could rely on the periodic alert. The offloading of this work of remembering appears to be a big benefit for scholars. In addition to this, some mentioned the use of citation alerts to track their own work as an important benefit, and some noted the benefit of help in creating a personal digital library using reference software such as EndNote.

Two other activities that scholars reported doing with the alerts they received were (1) downloading relevant citations into their EndNote databases and (2) e-mailing the author to receive a full-text copy of the article.

Other scholars described the hassles or downsides of eTOCs, such as getting overwhelmed by e-mail and having to get very picky about which eTOC to sign up for. This is particularly difficult when scholars sign up for various eTOCS and then receive multiple alert e-mails that they have to scan. Getting all eTOCs in one e-mail would lessen the e-mail load. One scholar suggested that submitting profiles to a Web site where publishers come together would be helpful in reducing the amount of e-mail alerts.

Online Article Searches

Topline Findings

Multijournal search Web sites that provide links to full text are the most popular starting points for article searches.

More than 70% of respondents said that they usually start searching for full-text articles from a multijournal search Web site that provides links to full text: 54% use PubMed, and 25% use some other multijournal Web site (such as Medline, Science Direct, etc.). Many fewer respondents reported starting from other points: 7% use online citation indexes, 6% use a specific journal's Web site, 3% use a general-purpose search engine, and only 1% use their local library's reference room and stacks. This probably reflects the degree to which the sample is online-oriented; a sample of more basic users of e-journals or of those with less online familiarity in general might yield different results.

Speed, familiarity, ease of use, and comprehensiveness are cited as the four features that make PubMed most popular.

PubMed was the most popular search Web site among our survey respondents. Among those who use PubMed, the top four reasons given for using it, in order, were that it is

1. fast (4,274)
2. familiar (4,219)

3. easy to use (4,194)
4. comprehensive (4,170)

These ranked characteristics cited as reasons for using PubMed as a search starting point were not very different from the pooled (entire) sample rankings. A similar number of respondents checked each of these four characteristics, suggesting that all are important criteria for a good search engine.

Users want search engines to be fast, easy to use, and comprehensive.

The most frequently experienced concern of searchers is not having enough links to free full-text articles in their search results (67% said they frequently experience this concern). Future search engines may thus need to be not only fast and easy but also linked to full-text articles. Links to full-text articles may make search engines more popular with users in the life sciences.

In addition to the reasons already listed for starting at a particular point, scholars reported other important criteria: file search capabilities, links to specific data, hyperlinks to full text, preprint availability, Boolean search capabilities, links to related articles, and capability to download to EndNote. These attributes are consistent with e-journal features that scholars find useful in general. Other important starting points scholars mentioned in open-ended responses include Current Contents, EndNote, PubCrawler, BioMedNet, other multiscience databases, and other specific Web sites or author Web sites.

Users like to see available formats and cost (if any) of full text as search results.

The top eight types of search results users like to see displayed (in rank order) are

1. title
2. journal name
3. author
4. date of publication
5. abstract
6. page numbers
7. form of linked full text (e.g., HTML or PDF)
8. whether there will be a charge to view full text

Although scholars sometimes demand better descriptors of the content for search results display, the data suggest that most people want the usual indicators. The two newer items respondents were interested in seeing were the forms of full text available and whether there would be a charge to view full text. This also indicates that scholars do expect to see a link to full text in their search results.

Searchers want more links to free full-text articles—and fewer, more relevant results from their searches.

The top three search concerns "frequently" experienced by feature users are:

- articles that are not available in full text online without a pay-per-view fee (67%)
- too many results returned from a search (41%)
- results not well sorted by relevance to search criteria (38%)

The frustration with unavailability of free full-text articles online has been documented elsewhere. The high levels of frustration with too many results being returned from searches and with results that are not well sorted by relevance are interesting. Only 28% of the respondents, however, reported frequently experiencing a return of articles on topics they weren't interested in—so the sheer volume of interesting articles currently being published in the life sciences may be a factor in the frustration with too many results.

Many fewer respondents reported that the other search concerns we asked about were frequent, but most were at least occasional concerns. Only 17% of respondents reported frequently experiencing articles without abstracts as a concern, but 70% did report this as an occasional problem. Likewise, only 27% reported that keywords that do not accurately represent article content were a frequent concern, but 62% did say that such keywords were an occasional concern. Only 17% reported lack of cross-reference searches across journals as a frequent concern, but 56% reported this as an occasional concern. Improvements in these areas might still be worthwhile. In contrast, 48% reported that becoming lost while searching was never a concern, only 6% found it frequently a concern, and only 46% found it occasionally a concern—so improvements may be less needed in this area.

Users read multiple screens of search results.

Nearly three-quarters (72%) of the respondents said they look at two to five screens of search results. Only 3% said they look at the first screen only, and 25% said they look at more than five screens. We conclude that users do read search results beyond the first screen. Difficulty in sorting by relevance may be preventing most feature users from reading beyond five screens—or those who sort by date may usually look for only the most recent year or two of articles (when frequently scanning the literature to "stay current," for example).

Pay-Per-View Features

Literature Review

Document delivery of individual articles (either in printed or electronic version) seems generally to be alive and well in the U.K. research community; 65% of respondents in Worlock's (2002) study

said they had ordered one to five articles each week, and two-thirds of those respondents said they prefer to receive full-text articles in hard copy. Age played a role in format preference, with electronic delivery preferred by twice as many of those under age 45 (40%) as those over age 45 (20%). Tenopir and King (2001a) note that the number of articles received by scientists in the United States—through document delivery, interlibrary loan, and other "separate copies"—has also grown, from 43 million copies in 1977 to more than 100 million copies in 1998. During the same period, the number of personal journal subscriptions per scientist has decreased.

Topline Findings

Pay-per-view is the least popular feature for survey respondents—and few would pay more than $10 per view.

Respondents were asked in the survey what motivated them to use pay-per-view and what they felt was a reasonable price for pay-per-view. The median price our sample of feature users would pay per article for pay-per-view is less than $3, and nearly everyone (98%) felt that the reasonable price to pay per article was less than $10.

The obvious answer as to why users do not use pay-per-view, then, lies in the huge difference between the current pay-per-view price of $30 or more per article and the willingness of users to pay only $10 at most per article view, even though they say pay-per-view is useful for urgent needs. Others have argued that online payment security is the major concern for users,[3] but what price users feel is reasonable also appears to be another important factor.

Users do use pay-per-view when they need articles urgently.

If we look at the top three experiences of users with pay-per-view, we conclude that users do not use pay-per-view in most cases, but many find it useful for urgent needs. Respondents agreed with the following statements in this order:

1. "I don't need pay-per-view because I already have access to whatever journal content I need through institutional or personal subscriptions." (3,427)
2. "I would not use pay-per-view under any circumstances." (3,400)
3. "I use pay-per-view only when I need an article urgently." (2,656)

Respondents appear to fall into two camps—those who find pay-per-view useful for urgent needs and those who say that on principle they would never use it. With the overall sample feeling that

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[3] Chuang, J.C.I., and Sirbu, M.A. Network delivery of information goods: Optimal pricing of articles and subscriptions. In *Internet publishing and beyond: The economics of digital information and intellectual property.* D. Hurley, B. Kahin, and H. Varian, eds. Cambridge, MA: MIT Press, 1999. In press. Available at *http://ksgwww.harvard.edu/iip/econ/chuang.html.*

anything over $10 per article is unreasonable, however, even those who find it useful for urgent needs are unlikely to pay the $30 per article often charged today.

Reading Preferences

Literature Review

Hitchcock and colleagues (1998) estimate that more than 80% of e-journals are presented in PDF. Studies by Tenopir and King (Tenopir 2000) between 1993 and 1998 found that scientists averaged 120 readings of scholarly articles per year. Three-quarters of readings by university scientists were for research purposes. Engineers read fewer articles, and medical faculty read more; nearly one-third of all articles read (on average across all scientists) were from e-journals or digital databases (Tenopir and King 2001b). Tenopir and King also found that in both academic and nonacademic settings, scientists whose work had been recognized by achievement awards read more on average than those who hadn't won awards. Tenopir and King's studies have also shown that scientists' estimates of the amount of time they spend reading per article have increased since 1977 from 45 minutes to 52 minutes per article, and the average length of articles has increased from 7.4 pages to 11.7 pages over the same period. Additionally, they found that scientists read at least one article from each of an average of 18 scholarly journals in a given year. The scientists tended to read only a few of those journals extensively, however.

Topline Findings

Feature users read seven journals and browse 12 journals regularly, on average.

The mean number of journals read regularly by respondents is 6.6; 26% of the sample read up to 3 journals, 30% read 4 to 5 journals, 17% read 6 to 9 journals, and 27% read 10 or more journals. About 50% of respondents read at least 5 journals regularly to stay current. The mean number of journals browsed regularly by respondents is 11.8; 26% of respondents browse up to 7 journals, 26% browse 8 to 10 journals, 23% browse 11 to 17 journals, and 25% browse 18 or more journals.

More than half of feature users read full-text articles and figures retrieved online on the screen.

More than half (56%) of our sample of feature e-journal users read full-text articles onscreen after online retrieval: 42% read full text onscreen in PDF format, and 14% read in HTML; 44% read printed copy rather than reading onscreen.

These data suggest that feature users adapt not only their article retrieval habits but also their reading styles, filtering their articles more onscreen before printing them out. Our first and third surveys, with a different sample population (both basic users and nonusers of e-journals), showed

that scholars still prefer reading a printout to reading full text onscreen (68% print out to read articles).

Although HTML is designed for reading onscreen and is easier on the eye, users prefer PDF for reading articles onscreen and for printing them out. Users may prefer PDF because it displays a whole page without the screen being scrolled down and it gives the length of articles, whereas HTML doesn't disclose how long the document is.

Another possible reason for users not to prefer HTML is that HTML pages are embedded with too many links, which can be distracting. We tested this hypothesis further in our follow-up (third) survey May 22 to August 1, 2002, of a different set of life scientists and practitioners (both online journal users and nonusers who were members of scholarly societies).

Feature users in this survey preferred HTML somewhat more for reading *figures* onscreen. Of the respondents in the second survey, 66% read figures and images onscreen—39% in PDF and 27% in HTML—whereas 33% preferred to print out figures and images and read the printed copy. Preferred formats for reading are correlated with age (just as our first survey showed that age correlates with journal format preference). More than any other age group, users ages 41 to 50 prefer to read full text onscreen rather than to print it out for reading. Being age 41 to 50 could be a proxy for job experience and career stage; more experienced readers may read/scan full text onscreen more often after online retrieval, using screen reading/scanning as a filter for choosing articles worthy of printing and reading more thoroughly.

Problems with E-Journal Features and Use

Literature Review

Rusch-Feja and Siebeky (1999) note a number of problems cited as disadvantages of e-journals by members of the Max Planck Society in Germany: most cited were incomplete issues, absence of back issues, and lack of archiving mechanisms. Our survey also found that the biggest problem (among those we asked about) was lack of back issues. In the Rusch-Feja and Siebeky study, having to read from the computer screen and having to depend on networks were also negative issues, as was the lack of an integrated access/interface system for all journals. The problem with lack of integration appears to be less severe for our respondents, with only 23% complaining about e-journals that don't provide links to cited articles. We did not ask specifically about difficulty in reading from the computer screen, but we did find that pictures that are too small to read clearly (in PDF) were not a big problem for most (77%) of the respondents in our sample.

Woodward, Rowland, McKnight, Pritchett, and Meadows (1998) report on the Café Jus project at a U.K. university, begun in 1996, in which 75 master's students were surveyed. The authors conclude that delays in gaining access (slow loading) and impediments to moving about within and between journals are "major demotivating factor[s]" in the use of e-journals. They also found that lengthy

onscreen reading was unpopular, partly because onscreen text and graphics were illegible, and that printing from e-journals also often caused problems and delays (less so for those with Postscript printers, however). In their study, no demographic factor (gender, status, computer expertise, or home/overseas background) correlated with identification of e-journal problems.

Back issues appear to be more important in some fields than in others (Tenopir and King 2000): 33% of what astronomers read from digital media is more than a year old, whereas only 15% of the material read by Oak Ridge National Laboratory engineers, chemists, and physicists is more than a year old. Interestingly, Tenopir (2000) reports that most articles (print or electronic) more than five years old are obtained from libraries, rather than through personal subscriptions. Tenopir also reports that few articles more than five years old are found by browsing; citations, online searches, other persons, and other means are all used more to find these older articles. In contrast, three-fourths of recently published articles are found by browsing. Tenopir also found that older articles tend to be used more for research purposes, whereas more recent articles are used more for teaching purposes. Older articles are more useful for research and are rated higher in importance; more time is spent reading them. Tenopir suggests that all of this means that online back issues will be crucial for scientific research.

Topline Findings

Lack of back issues is a big problem for users; most other concerns are mere nuisances.

Of the respondents to our study, 75% reported that lack of available back issues online was "a big problem" (see Table 2). Other listed problems are relatively minor compared to "e-journals that don't provide access to older issues." This clearly indicates that providing deeper back issues online would be valuable to feature e-journal users.

Table 2: Problems with Current e-Journals

Potential Problem	Considered a Big Problem (%)	Considered a Minor Nuisance (%)	Not Considered a Problem (%)
E-journals that don't provide access to older issues	75	22	3
Videos or animated graphics that play slowly/poorly	39	49	12
Pictures in PDF that are too small to be read clearly	33	42	25
E-journals that don't provide links to cited articles	23	54	23
Pictures in PDF that are black-and-white instead of full color	21	46	33
Pictures in HTML that load slowly	19	58	22
Articles in PDF that load slowly	13	50	36

The next most common problems reported were slow and poor quality of video or animated graphics, pictures in PDF that are too small to be read, and e-journals that don't provide hyperlinks to cited articles. Most respondents did not consider slow downloading of PDF or lack of color in text to be big problems. Users perceived PDF fonts that were too small and unclear as being more problematic. Despite these problems, however, users prefer PDF for reading articles to decide whether the articles are of interest to them.

Feature users can live without hyperlinks to cited articles—but such hyperlinks are useful.

Surprisingly, although hyperlinks to cited articles were the most popular online feature, only 22% of respondents indicated that failure of e-journals to provide such hyperlinks was a big problem. (Note, however, that this was the most common problem listed when user responses of "a big problem" and "a minor problem" were added together.) More medical doctors than non-MDs reported this as problematic, consistent with the finding that MDs prefer hyperlinks to cited articles more than do non-MDs. Not having enough hyperlinks to cited articles is also more problematic to users outside of the United States and Canada than to users from these two countries, as might be expected if users from other countries depend more on e-journals for access to articles.

Problems with PDF do not vary by full-text reading format preference (onscreen versus printout).

Those who read full-text articles in PDF format onscreen and those who prefer to print out articles to read them do not differ significantly in how they perceive problems (specifically, pictures that are too small to be read clearly) with current PDF articles.

Infrastructure matters in the perception of problems with downloading.

Slow downloading is only a minor problem for users (50% say that slow downloading PDF is a minor problem, and only 13% say it is a big problem; 58% say slow downloading pictures in HTML is a minor problem, and 19% say it is a big problem). Few users reported downloading PDF and HTML to be a big problem. One explanation of these findings is that slow download is related mainly to users' local infrastructure, such as old computers and slow local servers.

Society Memberships and Journal Subscriptions

Literature Review

Tenopir (2000) has shown that the proportion of article readings from personal subscriptions has dramatically decreased since the 1970s (from 68% to 27%), as the proportion of readings from library subscriptions has increased (from 15% to 55%); the proportion from separate copies has remained the same (17% versus 18%). The number of personal subscriptions per scientist has gone down by half over the same period (from about six to about three). University scientists read an average of three times more library-provided articles than in 1977, and scientists in other organizations average seven times more. Moreover, 94% of readings of articles more than five years old are of articles obtained through institutional subscriptions; only 2% are of articles obtained from personal subscriptions, and 4% are of articles obtained from other sources.

Our survey did not ask about the proportion of article readings, but rather looked at the number of feature users who had joined societies and ordered or cancelled personal subscriptions in the previous year and at their reasons for doing so. We cannot say from our data anything about the number of society memberships or personal subscriptions of the average scientist; rather, we focus on feature e-journal users and on their subscription and membership behaviors and motivations.

Topline Findings

Economics is an important motivation for joining societies.

The most popular reason cited for joining a society was to support the organization's mission, but the second and the third most frequent motivations were both economic benefits of membership—free or discounted journals and reduced rates to attend conferences.

Our survey respondents averaged one to two society memberships. Life scientists and practitioners are members of societies in their own fields. Societies may thus continue their traditional role of being a center for scholars' communications by providing conferences and journals to users.

Subscribers are price sensitive.

Our data show that members do consider economic reasons for membership seriously. Only 37% of respondents subscribe to journals that don't come with memberships.

Nearly one-quarter (22%) of the survey respondents had canceled journal subscriptions within the past year. Publishers have argued that online journals crowd out personal subscribers because libraries provide free access to online journals. Our data tell a somewhat different story. The most frequent reason for canceling personal subscriptions in 2001 was that the journal subscription price had increased sharply, beyond the respondent's budget. Journal subscription prices have increased significantly over the past few years, partly because of the cost of providing online services and adapting to this new technology. Journals have transferred costs to subscribers and, apparently as a result, have lost many personal subscribers.

Classical economic price theory then plays a role. Subscription revenue consists of two factors: price (subscription price) multiplied by quantity (number of subscribers). An increase in either price or quantity will increase revenue, assuming the other factor holds constant. But price and quantity affect each other. If quantity decreases when price increases, then price increases may cause total decreases—rather than increases—in revenue. If subscribers are price sensitive, then, increasing the price of subscriptions might lead firms to lose revenue. Libraries of small liberal arts colleges and state universities have been undergoing budget problems, for example, and if subscription prices increase beyond their budgets, they might cancel journal subscriptions, leading to serious problems for both subscribers and the publishing business.

Online features attract more personal subscriptions.

We asked respondents whether they subscribed to new journals last year and found that 18% did. The top reason for having a new journal subscription was to have more convenient access to journals (870 respondents agreed to this). The second reason was that a journal had gained importance in the respondent's field (710 respondents), and third was that the respondent wanted to take advantage of some features the journal had available online (631). These reasons imply that journals may be able to attract more personal subscribers by providing online features and more convenient access to journals.

New Features Demanded by Users

We asked respondents to answer the following question: "What ONE e-journal feature would you MOST like to see added by the journals that you read online, and WHY?" The 3,464 answers we received from respondents are mainly in line with our survey findings on problems with features.

Users want increased access to content.

Although access to full-text articles is not strictly speaking a feature, many feature users expressed a desire for easier and cheaper or free access to full-text articles. "FREE FULL TEXT ACCESS—isn't it obvious why?" one respondent asked. Respondents also want access to back issues (preferably in PDF formats); 75% of survey respondents reported lack of such access to be a big problem.

Users prefer PDF formats.

Respondents confirmed the popularity of the PDF format. "Pdf, pdf and pdf," one respondent emphasized. "Printing out figures and tables with other formats (eg HTML, CGI) is hopeless."

A few respondents expressed a hope that PDFs would soon be able to support "hypertext linking to articles and Web pages from the PDF." In addition, several suggested that journals could solve the problem of slow download speeds (a minor one with respondents overall) by providing PDF e-mailing services so that users don't have to wait for articles to download themselves. Interestingly, a few respondents also asked for articles on tape: "Small file size audio file with someone reading me the article so I can copy to CD and listen in the car."

Scientists want more links to aid in navigation.

Comments about hyperlinks confirmed the survey finding that searchers want more links to free full-text articles. The top desired feature for a substantial number of respondents is hyperlinks for every reference; other respondents asked if e-journal publishers could provide hyperlinks for every eTOC.

Users want features that provide links to authors via their e-mail addresses or their Web sites. Links to the main author's curriculum vitae were also suggested.

Users want standardization across search environments and journals to make searching and navigating information easier.

Respondents noted specifically that they would like to see a single, unified search environment. They want to be able to make universal citation-based searches. Standardized article formats, especially for references, would make it easier for them to download and manipulate data, they said.

Readers want features to help them measure the value of articles.

Respondents had several specific suggestions for such features, including

- forward referencing (links to articles that cite the article in question)
- "a summary of the five to ten most pertinent references or reviews supporting the research findings"
- "number of full-text or abstract viewers/downloaders/etc. for each article; number of subscribers (print/online/institutional online), because this would give a nice estimate for the amount of interest that there is for individual topics (supplementing citation counts) and for the journal in general"
- an online discussion of results appended to each article
- links to other articles by the same author

Users want features that provide for enhanced exchange of information.

With such features, a user might be able to get an answer to the question, for example, "Who in my neighborhood has a current subscription to the journal for which I'm visiting the Web site?"

One respondent suggested student services as a feature.

One respondent suggested "students' services, because students are the future doctors." The respondent did not specify what such services might be, however.

IV. Discussion of Findings

Important Preferences for Reading Among Life Scientists

Here we use "read" in a broad sense and define "reading" as reading scientific and medical journals. There may be two different types of "reading" involved with scientific journals: reading for relevance (when scholars quickly scan the articles they find as a result of a search to find out which of them are really worth further perusal) and reading for understanding (when scholars know an article found through a search is of interest and read it to understand its contents). Our findings show that some scholars "read" articles found online onscreen first, whereas others print out the articles before "reading." Further studies would be necessary to determine whether these "readings" are for relevance or for understanding.

Our ethnographic interviews have shown that scholars do scan articles, in paper and in electronic form, to assess whether they should print, download, save, read intensively, and so on. They use various tactics to do so, depending on what they are looking for and why. Some scan by jumping directly to a conclusion, some jump directly to methods, some look at all of the pictures or graphs, and some scan or read the abstract. Scholars already read paper articles (whether bound or printed from e-journals) in a nonlinear fashion (as well as linearly). If there are ways to facilitate nonlinear reading in electronic form—through modular content and metadata, for example—all the better. This is a key area in which e-journals can add new dimensions to journals and scholarly practice, supporting reading behaviors that are already in practice in crude form for paper articles and that might eventually lead to new forms of reading and publishing. Our survey results support the idea that scholars have many different kinds of reading and scanning practices.

Even among feature users, older (and therefore possibly more experienced) users are more likely than younger users to "read" articles onscreen right after retrieving them online than to first print them out. When readers have large volumes to read (as experienced scholars usually do), they may be more likely to read articles for relevance onscreen as a first step, printing out only those worth a deeper reading for full understanding. This also saves paper. Our findings that printed copies are still the ultimate goal for most e-journal users suggest that paper article copies will not disappear anytime soon, however.

Realistic Value and Pricing of Online Services and Features

Pay-per-view, along with interlibrary loan and direct contact with authors, can be thought of as an alternative method of journal subscription for retrieving full text.[4] The huge price gap we reported between current price and the price users are willing to pay for pay-per-view explains why users rarely use pay-per-view despite a clear potential use (the urgent need for an article).

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[4] Our data show that pay-per-view will not replace online journal subscriptions (based on only 108 responses; see Appendix II, Question 19a).

Many articles in specific scientific and medical journal issues may not be of interest; journal subscriptions can thus waste subscribers' money. Pay-per-view could theoretically be useful for obtaining articles of interest on an as-needed basis instead of paying for access to a whole issue. The current price of pay-per-view is sending the wrong message to users, however. Current $20 to $35 charges per one-time view of one article provide no incentive for users to choose this option, diminishing the potential usefulness of the pay-per-view feature.

Users may use pay-per-view once for an urgent need but may not come back to it regularly because they do not feel that the price is reasonable. Pay-per-view thus may not be profitable for publishers unless the price per use is lowered. For this reason, some publishers have raised questions about the cost-effectiveness of having pay-per-view available to users. Current prices of pay-per-view articles may in fact dissuade scholars from returning to use pay-per-view or from ever using it.

Alternative Value Propositions and Business Models

In the beginning of new technology adoption, the cost is typically high both for the supplier of the technology and for those who buy it. As the adoption process progresses, however, the marginal cost decreases, and suppliers start to make a profit. Suppliers most commonly react to the costs of adopting new technology by transferring these costs to their customers. This rarely works, however, if the market size is fixed and if customers are price sensitive.

The scientific journal market is relatively stable and has a fixed size of customers. According to our findings, scientific journal subscribers (specifically feature users) are price sensitive, and yet many say they order new subscriptions to take advantage of particular online features. To maintain profits under current models, journal publishers need to maintain subscriber base size (both personal and institutional). A more moderate increase in subscription prices paired with the customizing abilities of online features could be most effective in maintaining the size of the customer base. Customization through a variety of online features combined with more moderate prices should sell more personal subscriptions to individual scholars.

A more complicated issue is how to build pricing models for selling subscriptions to libraries. Once journals sell subscriptions to libraries, the journals are no longer privately owned. They are available to the public without any cost or with little cost. If based on the number of users, subscription prices for libraries should be very high. As is well known in the economic theory of public goods, however, it is harder to measure how many people use the services of public institutions such as libraries than it is to measure use of private services. This creates challenges for business models. Although this survey did not include questions relevant to pricing models for subscriptions to libraries, other research methods used in our study—in particular, a round of interviews with experts in e-publishing—will provide useful data and will be discussed in our final project report.

V. Implications

In this section, we suggest possible business models and strategies for publishers and aggregators in the current economic downturn. We also emphasize the true meaning of successful publishing. The true success of publishing is measured by its dissemination of scholarly work. Publishers and aggregators should consider their primary role in scholarly communication as information disseminators before they pursue profits. Developing new services or journal policies should serve (and certainly should not compete with) the main purpose of journals—to increase the dissemination of scholarly work all over the world.

Although the United States is currently in an economic downturn, survey data suggest several ways for publishers to keep market share in the era of e-journals. First, to attract both personal and library subscribers, more moderate subscription price increases are recommended. Our data show that a price increase beyond the budgets of scholars is the most common reason for personal subscription cancellations. For personal subscriptions, price increases should be below the annual inflation rate. (The average increase in annual salary is currently less than or equal to 3%.) For library subscriptions, increases should also be relatively moderate over the proximate future as libraries are increasingly considering canceling subscriptions. With most feature users relying on institutional subscriptions to access full-text articles (including those cited in e-mail alerts), libraries are not only customers but also partners in the e-publishing business.

Second, our data show that new online features attract new individual subscribers (and society memberships). By creating new online features, publishers make the online environment more customizable to the needs of individual subscribers.

Third, publishers need to realize that the e-journal and the printed edition are very different. Well-known model theories suggest that online journals may require different pricing schemes and marketing strategies. Pricing online products separately, rather than selling online subscriptions packaged with the printed edition, may be helpful, although nothing in the second survey tests this specifically; further research is indicated.

Fourth, subscriptions for both individuals and libraries need to be modified from a package sell to more choices (differentiated products) and differentiated prices per product. Individuals like to have choices, and their preferences for different products can vary by demographic characteristics. One example is country of residence. Subscribers outside of the United States and Canada may like to have online subscriptions because they save money and get faster delivery than of printed editions sent from abroad, whereas U.S. and Canadian subscribers might prefer to have printed editions in addition to online subscriptions, because delivery of printed editions of North American journals is less expensive. Feedback from open-ended questions suggests that online free subscriptions are critical for developing economies. The online journal world offers new ways to provide content at little or no cost to the publisher.

Libraries also prefer to have title choices. As online journals become more established in the scholarly community and as users find new ways to use them, publishers may need to develop pricing and marketing schemes that differentiate more sharply between online editions and printed editions.

Fifth, free hyperlinks to articles not only within a journal but also across journals (toll-free links) help increase e-journal usage and may even increase individual online subscriptions. This was a strong theme in open-ended responses to question 20 (suggested new feature development). Clearly, users want this, but feasibility depends upon whether journal publishers are willing to work together and also upon solutions to formidable technical issues *between* publishing platforms. Despite these difficulties, HighWire press is encouraging toll-free linking among all its journals.

VI. Appendices

Appendix I: Descriptive Statistics of Demographic Variables

The second survey was conducted online as same as the first survey the survey investigated e-journal users' preference over the features and their frustration with current e-journal features. The questionnaire also asked about payment methods and search behaviors. The data provide very useful information on how to design user-friendly electronic page and efficient search engines.

Target Population:
Life scientists and medical professionals who are comfortable to use/ read online version of scientific journals. Presumably, this population is the representative of those who use online journals to retrieve articles regularly.

Survey Design:

- *Sampling*: 39 society based scientific and medical journals participated in the second survey. We obtained email addresses from the list of electronic Table of Contents (eTOC) per journal. ETOC is free to everyone and it provides the service which journals send email alerts when new Tables of Content are available.

- *Comparison with the first survey:* The second survey questionnaire has many open ended questions while the first survey had not included any (though we received about 200 written feedback from survey respondents). The second survey has a different sample population and both data not compatible. The future and last online survey data (tentatively scheduled May 22, 2002) will be merged to the first survey data one to one.

- *Online questionnaire*: This is best viewed (though not active for data collection) at http://ejust.stanford.edu/usersurvey2-linked.htm

- *Solicitation methods*: We sent 83,925 email solicitations, requesting members to respond via the questionnaire on the web. 76,210 addresses returned "undeliverable" or "technical errors", resulting in a contact group of 83,925.

- *Survey implementation and data collection period*: November 26- December 21, 2001

- *Survey response rate*: Approximately 10,400 responses were received during the period, the survey response rate is around 13.6%.

Appendix II: Charts and Tables

The following list with hyperlinks to charts and tables can be found online at:
http://ejust.stanford.edu/findings2/survey2_charts.html

The full text of the survey questionnaire is also available online at:
http://ejust.stanford.edu/usersurvey2-linked.htm

Features of Online Journals

1. What is your experience with the following e-journal features?

      1_3   Videos or animated graphics
      http://ejust.stanford.edu/findings2/Q1_3.pdf

      1_4   Links to cited article in same journal
      http://ejust.stanford.edu/findings2/Q1_4.pdf

      1_5   Links to cited article in a different journal for no charge journal (toll-free linking)
      http://ejust.stanford.edu/findings2/Q1_5.pdf

      1_6   Links to a scientific database
      http://ejust.stanford.edu/findings2/Q1_6.pdf

      1_7   Links to author's email address
      http://ejust.stanford.edu/findings2/Q1_7.pdf

      1_8   Links to author's web site
      http://ejust.stanford.edu/findings2/Q1_8.pdf

      1_9   Pay-per-view (online payment for immediate access to a single article)
      http://ejust.stanford.edu/findings2/Q1_9.pdf

      1_10   Electronic manuscript submission
      http://ejust.stanford.edu/findings2/Q1_10.pdf

      1_11   Online peer reviews
      http://ejust.stanford.edu/findings2/Q1_11.pdf

      1_12   Access to articles "in press" (peer-reviewed/accepted but not yet edited)
      http://ejust.stanford.edu/findings2/Q1_12.pdf

2. How problematic, if at all, are the following issues with e-journal features?

      2_1   Videos or animated graphics that play slowly/poorly
      http://ejust.stanford.edu/findings2/Q2_1.pdf

2_2   Articles in PDF that load slowly
http://ejust.stanford.edu/findings2/Q2_2.pdf

2_3   Pictures in PDF that are too small to read clearly
http://ejust.stanford.edu/findings2/Q2_3.pdf

2_4   Pictures in HTML that load slowly
http://ejust.stanford.edu/findings2/Q2_4.pdf

2_5   Pictures in PDF that are black-and-white instead of full color
http://ejust.stanford.edu/findings2/Q2_5.pdf

2_6   E-journals that don't provide links to cited articles
http://ejust.stanford.edu/findings2/Q2_6.pdf

2_7   E-journals that don't provide access to older issues
http://ejust.stanford.edu/findings2/Q2_7.pdf

Alert Services

3.   I was motivated to sign up for email alerts (content or citation alerts) for the following reasons...
http://ejust.stanford.edu/findings2/Q3.pdf

4.   For most journals I receive email alerts for, I have access to full-text articles online through...
http://ejust.stanford.edu/findings2/Q4.pdf

5.   My first step in following up on articles I see in email alerts is usually...
http://ejust.stanford.edu/findings2/Q5.pdf

Searching for Articles Online

6.   What kind of information do you want to see displayed immediately about articles your search found?
http://ejust.stanford.edu/findings2/Q6.pdf

7a.   Where do you usually begin searching for journal articles?
http://ejust.stanford.edu/findings2/Q7a.pdf

7b.   I begin searching at the site I checked above because it...
http://ejust.stanford.edu/findings2/Q7b.pdf

8a.   What is your most preferred format for reading full-text e-journal articles on the screen?
http://ejust.stanford.edu/findings2/Q8a.pdf

8b.   What is your most preferred format for reading figures and images on the screen?
http://ejust.stanford.edu/findings2/Q8b.pdf

9a.   When searching for scientific journal articles online, how often do you experience each of the concerns listed below?

      9a_1   Too many results returned
      http://ejust.stanford.edu/findings2/Q9a_1.pdf

      9a_2   Results not well-sorted by relevance
      http://ejust.stanford.edu/findings2/Q9a_2.pdf

      9a_3   Key words do not accurately represent article content
      http://ejust.stanford.edu/findings2/Q9a_3.pdf

      9a_4   Titles not informative enough about article contents
      http://ejust.stanford.edu/findings2/Q9a_4.pdf

      9a_5   Articles don't provide abstracts
      http://ejust.stanford.edu/findings2/Q9a_5.pdf

      9a_6   Articles on topics I'm not interested in
      http://ejust.stanford.edu/findings2/Q9a_6.pdf

      9a_7   Search engines that don't provide searches across journals
      http://ejust.stanford.edu/findings2/Q9a_7.pdf

      9a_8   Articles not available in full-text online without paying-per-view
      http://ejust.stanford.edu/findings2/Q9a_8.pdf

      9a_9   Becoming lost when following up on search results
      http://ejust.stanford.edu/findings2/Q9a_9.pdf

9b.   In general, how many screens of search results do you look at?
http://ejust.stanford.edu/findings2/Q9b.pdf

9c.   When I have a citation and I'm trying to locate the article, I usually search on...
http://ejust.stanford.edu/findings2/Q9c.pdf

9d.   When I'm searching for articles on a particular subject, I usually search on...
http://ejust.stanford.edu/findings2/Q9d.pdf

Staying Current in Your Field

10.   How many different scientific journals do you regularly read (at least one full-text article) or browse (titles/abstracts), whether in print or electronically, to "stay current" in your own field(s)?

      10_1   Number of journals read
      http://ejust.stanford.edu/findings2/Q10_1.pdf

10_2   Number of journals browsed
http://ejust.stanford.edu/findings2/Q10_1.pdf

11.   I usually access these scientific journals (to stay current in my own field) through...
http://ejust.stanford.edu/findings2/Q11.pdf

Society Memberships and Journal Subscriptions

12.   Currently, of how many professional/scholarly societies are you a member?
http://ejust.stanford.edu/findings2/Q12.pdf

13.   Please check all the reasons that motivated you to join the professional/scholarly societies of which you are currently a member.
http://ejust.stanford.edu/findings2/Q13.pdf

14.   Do you personally subscribe to any scientific journals other than those that come free or discounted with your society memberships?
http://ejust.stanford.edu/findings2/Q14.pdf

15.   Have you canceled any personal scientific journal subscriptions in the past year?
http://ejust.stanford.edu/findings2/Q15.pdf

16.   Why did you cancel these personal scientific journal subscriptions in the past year?
http://ejust.stanford.edu/findings2/Q16.pdf

17.   Have you subscribed to any new scientific journals in the past year?
http://ejust.stanford.edu/findings2/Q17.pdf

18.   Why did you start subscribing to those new scientific journals?
http://ejust.stanford.edu/findings2/Q18.pdf

Pay-Per-View

19a.   Which of the following statements represent your experience and views regarding pay-per-view?
http://ejust.stanford.edu/findings2/Q19a.pdf

19b.   If you would use "pay-per-view" under some circumstances, what do you feel is a reasonable price to pay per article online, in US dollars?
http://ejust.stanford.edu/findings2/Q19b.pdf

Sample Population Demographics

21.   What kinds of organization(s) are you currently working or studying at, or affiliated with?
http://ejust.stanford.edu/findings2/Q21.pdf

22.   What is your position?
http://ejust.stanford.edu/findings2/Q22.pdf

23.   What is your country of residence?
http://ejust.stanford.edu/findings2/Q23.pdf

24.   What is your age?
http://ejust.stanford.edu/findings2/Q24.pdf

25.   Are you male or female?
http://ejust.stanford.edu/findings2/Q25.pdf

26.   What are your primary field(s) of study/training?
http://ejust.stanford.edu/findings2/Q26.pdf

Appendix III: List of Participating Journals

21 societies were participated in the second survey (a user survey), and some societies have multiple journals so we selected journals within a society to represent fields in life sciences. The selected journals are:

1. The American Society for Microbiology
- Journal of Clinical Microbiology
- Journal of Virology

2. The American Physiological Society
- American Journal of Physiology-Cell Physiology
- American Journal of Physiology- Regulatory, Integrative and Comparative Physiology
- American Journal of Physiology- Gastrointestinal and Liver Physiology
- American Journal of Physiology- Heart and Circulatory Physiology
- American Journal of Physiology- Lung Cellular and Molecular Physiology
- American Journal of Physiology- Renal Physiology
- American Journal of Physiology- Endocrinology and Metabolism
- Journal of Applied Physiology
- Journal of Neurophysiology
- Physiological Review

3. American Association for Clinical Chemistry
- Clinical Chemistry

4. The American College of Chest Physicians
- Chest

5. American Society of Plant Biologists
- The Plant Cell
- Plant Physiology

6. American Society for Nutritional Sciences
- The Journal of Nutrition

7. The American Society for Biochemistry and Molecular Biology
- The Journal of Biological Chemistry

8. American Society for Pharmacology and Experimental Therapeutics
- The Journal of Pharmacology and Experimental Therapeutics
- Pharmacological Review
- Molecular Pharmacology

9. The Botanical Society of America
- American Journal of Botany

10. The Endocrine Society
- Journal of Clinical Endocrinology & Metabolism
- Endocrine Reviews
- Endocrinology
- Molecular Endocrinology

11. Society for the Study of Reproduction
- Biology Reproduction

12. The Royal Society of Medicine
- Journal of Royal Society of Medicine

13. Society of Investigate Dermatology
- Journal of Investigate Dermatology

14. American Society of Hematology
- Blood

15. Radiological Society of North America
- Radiology
- RadioGraphics

16. American Heart Association
- Stroke
- Circulation

17. American Association of Immunologists
- The Journal of Immunology

18. The Royal College of Psychiatrists
- British Journal of Psychiatry

19. The Phycological Society of America
- Journal of Phycology

20. The Society of Nuclear Medicine
- Journal of Nuclear Medicine

21. Proceedings of National Academy of Science
- Proceedings of National Academy of Science

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