

# ◆ *Lessons Learned: Innovations in Scientific Communication*

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## Knowledge Environments

*Science* has embraced the concept of knowledge environments (KEs), which are totally electronic Web sites devoted to publishing information about science and medicine and offering a totally online journal. KEs can be customized to suit individual users' needs, and they provide a virtual community, multimedia resources, and dynamic tools for exploring information.

*Science* has two such KEs, one devoted to cellular signaling (STKE) and one devoted to aging (SAGE KE). Those topics were chosen because no major journal or society focused on them, they are interdisciplinary, the information is complex and widely distributed, and they are well suited for use of the Web to organize information.

The biggest challenge in developing KEs, said Nancy R Gough, managing editor of *Science's* STKE, is to maintain the best aspects of print journals. To achieve that, PDF files are created to make reading easy, articles are indexed in PubMed so that they are integrated with the standard literature, and articles are fully citable with easily downloadable citations compatible with most reference-managing software.

Several lessons have been learned:

- Issue-based indexing is essential because librarians want to see issue archives and be assured that online information is available after initial posting.
- Tables of contents are a must for PubMed indexers and site users to facilitate locating information.
- Customizable tools—such as My Folders, My Saved Searches, My Display Settings, and My Alerts—are popular, with folders and alerts the most frequently used.
- Fast searches are essential for maintain-

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ing user interest, and My Saved Searches is a popular customization tool.

- Online discussions are underused because users are reluctant to “talk” in a written form online.

Online-only journals, such as those included in KEs, have become more acceptable to authors and readers, as evidenced by the more than 25,000 visits to STKE each month.

## New Digital Products

Robert Kelly, journal information systems director with the American Physical Society (APS), discussed digital products being developed by APS.

Online plus print and online-only are offerings used by APS to publish its various journals and provide scientific information to users. Some APS articles date back to 1893, so obviously huge amounts of information are being archived online, and this is quite challenging, said Kelly.

Kelly noted a number of lessons that

APS has learned. First, preprint archives are not a threat to subscriptions but are part of the communication process.

Second, although the normal two-column format works well in print, single columns work best online. Given the potential of dynamic formatting, questions of layout must be addressed.

Third, archives are gold. They can be used as a source of funding. *Physical Review* is offered by subscription. The current year is in print form, and some previous years are available on CD-ROM to subscribers only. The CD-ROM has functionality equivalent to that of the bound volume. The lesson learned here is that print is still required in some instances. The CD-ROM is a stopgap in the transition from journal to database.

Fourth, it is essential to store content in two locations. Because APS had content stored in more than one place, the Web site was able to continue operating in spite of the East Coast blackout.

Fifth, when making changes in the online setup, one needs to look at the process on a worldwide and STM processwide basis and be cognizant of the effects that a single change can have. Shorter publication time can lead to quality issues; however, online-first sets the stage for deconstruction of the print journal and allows repackaging of the articles. Virtual journals are an example of deconstructing and repackaging.

The main lesson learned is that if you are going to survive and compete in the ever-changing worlds of e-journals and digital communication compounded by the increasing amount of information and the decreasing amount of funding to pay, you must reduce costs of composition, peer review, and subscription; improve functionality to facilitate reading online; include multimedia; and expand revenue opportunities by going beyond the traditional markets. 🗣️