



Weaving a New Web



The ever-changing role of the worldwide web offers new opportunities for scientific communications. Sabine Duntze at b3c communications evaluates its potential

Sabine Duntze runs b3c communications, a PR agency specialising in biotech and life science communications. She has over eight years of marketing and PR experience in the biotech sector, and a strong scientific background through many years of research at the Pasteur Institute in Paris and the Max Planck Institute for Immunobiology in Freiburg, Germany. She received her PhD from the University of Braunschweig in Germany.

The role of the internet in scientific communications is rapidly evolving. From a mere tool for reading and responding to email, and searching for articles and product information or protocols, we are witnessing its development into a hyper-networked platform that offers excellent opportunities for both scientists and businesses to reach wider audiences, as well as improve communications within their own communities.

Terms such as RSS, atom, XML, trackback or social web, to name just a few are some of the buzzwords defining Web 2.0. It is all about crosslinking up-to-date content with people. A typical example of a Web 2.0 application is the so-called wiki, derived from the Hawaiian word for 'fast', such as the online encyclopaedia 'Wikipedia'. Wikipedia is particularly noteworthy as it allows people to comment on and edit one another's text, resulting in the most vital and dynamic encyclopaedia available worldwide. From a technical point of view, the content of a wiki site is self-crosslinking, meaning that if an author mentions a specific keyword, it links automatically to other relevant pages.

In the early 2000s, wikis were increasingly adopted in businesses as collaborative software. Common uses included project communication, intranets and documentation; and they were initially meant for technical applications. Today, some companies exclusively use wikis as their collaborative software and as a replacement for static intranets. It is, therefore, not difficult to imagine that such novel technologies will also find their way into other sciences, and that laboratories may one day use a wiki-like platform to update their results and experimental protocols, for example.

SCIENTIFIC BLOGS AS A COMMUNICATIONS TOOL

A major advance in scientific communications has been achieved through blogs. A blog, a portmanteau of 'web log', is a website in which entries are written in chronological order, just as with online diaries. Blogs provide commentary or news on a particular subject and combine text, images and links to other blogs and web pages related to their topics. The opportunity for readers to leave comments in an interactive format is an important part of many blogs. Blogs can be easily set up and maintained and can allow

scientists to reach a potentially global audience, in order to discuss technical and scientific aspects of their work and contact people working in the same field.

Communications managers will also eventually embrace the marketing opportunities opened up by blogs. They can, for example, get in touch directly with scientists at the bench to provide them with solutions for their specific problems and persuade them using scientific terms rather than marketing jargon. However, this will have to be done carefully and not anonymously in order to avoid offending the dialogue partner. Microsoft, for example, supports a blog from the Microsoft Developer Network, in which developers provide technical details about upcoming products. Perhaps in the near future we will see biotechnology companies dedicating webspace for their own blogs, leading to enhanced customer acquisition and loyalty. At present, blogging is still far from ubiquitous, but it will surely become more and more popular as users get better acquainted with it.

NATURE PRECEDINGS – PREPRINT SERVER AND DOCUMENT-SHARING SERVICE

Nature Precedings, the online journal of the Nature Publishing Group launched in June this year, takes a revolutionary approach to scientific communications. The journal provides scientists for the first time with a rapid and free of charge way to disseminate emerging results and new theories. Scientists can share preliminary findings, unpublished manuscripts, speculative findings, presentations, posters and other scientific documents, while at the same time claiming priority over discoveries. Since ideas generate other ideas, the speed with which scientific knowledge could evolve with such an approach is exciting.

Nature Precedings does not have a peer review system in the traditional sense. A curation team screens new submissions only to ensure appropriate content. The submissions are not subjected to editorial or peer review for quality or significance. However, the submissions are subjected to open review after their release through user comments and votes. According to the Nature Publishing Group, the new website fulfils the role of a preprint server like the popular arXiv.org service in the physical sciences, trying to

***PLoS ONE* facilitates the discovery of the connections between papers whether within or between disciplines.**

facilitate the discovery of interesting and relevant content through user-driven features such as tagging, voting and commenting.

So far, scientists have presented and discussed their ideas and preliminary findings in lab meetings, at conferences, in poster sessions or, more informally, during coffee breaks. The problem is that information gathered in this manner is usually not easy to share in a truly global fashion, and is not formally citable. *Nature Precedings* overcomes these limitations by allowing scientists to share their thoughts with a much broader, geographically unrestricted, audience in a way that can be later cited.

PLOS ONE JOURNAL – FREELY AVAILABLE ONLINE

In contrast to *Nature Precedings*, the data contained in manuscripts submitted to the *PLoS ONE* online journal must be complete. The *PLoS ONE* journal is an international, peer-reviewed, open-access publication that was established by the not-for-profit organisation Public Library of Science (PLoS) in 2006.

PLoS ONE is distinguished by its peer-review process, which concentrates on technical and methodological soundness rather than subjective concerns or perceived importance or relevance of the work. It features reports on primary research from all disciplines within science and medicine. The publishers say that by not excluding papers on the basis of subject area, *PLoS ONE* facilitates the discovery of the connections between papers whether within or between disciplines. Accepted papers are made available for community-based open peer-review involving online annotation, discussion, and rating. Everything is immediately available online to read, download and even redistribute even in databases - subject only to the condition that the original authorship is properly attributed. To cover the expenses of peer-review, journal production, online hosting and archiving, authors are charged a publication fee of US\$1,250.

As with *Nature Precedings*, the content of *PLoS ONE* may be quoted, copied and disseminated for any purpose if the original source is correctly cited. Submissions are therefore assigned a unique and permanent identification number called the digital object identifier (DOI). In both online journals, the authors retain copyright of the articles through a Creative Commons Attribution License. Both sites also have Web 2.0 features, such as RSS feeds and tags enabled. Users are asked to give annotations and comments on articles and postings to boost connectivity and interactivity.

ONLINE PUBLISHING WITHIN A WORKING DAY

The speed with which scientific communications can be published using online journals such as *PLoS ONE* or *Nature Precedings* is incredible. Compared to traditional print journals, for which the publication process takes a few months to complete, online

publishing can be done within a working day. Also, scientists have the opportunity to present their work to a huge audience considerably more quickly and without a time-consuming peer-review.

Many scientists think that the traditional journal peer-review model, through which a few people decide on whether a piece of work is published or not, is now outdated. Online publishing could provide an alternative peer-review concept, in which the community as a whole decides which papers are interesting and worthwhile, and which are not, by simply commenting and voting on the articles.

In combination with the DOI citation function, the open exchange and re-use of ideas and data might accelerate science enormously, while at the same time facilitating the detection of research redundancies and the formation of interdisciplinary research co-operations.

OLD PARADIGMS ARE DIFFICULT TO CHANGE

However, the success of open publishing in science stands and falls with the participating scholars. Many laboratories may be cautious about releasing novel findings or new ideas for fear of being outplayed by others. So will there be enough scientists ready to use these novel media for research publications? Will the quality of the published data be high enough to ensure a good reputation for these online journals? And will the users take the time not only to retrieve information, but also to engage themselves in meaningful discussions?

Many researchers will prefer to publish in traditional journals as long as scientific reputation is judged by the number of publications and the quality of the journals in which the work is published. However, when the criteria for reputation change and when obtaining high peer ratings or playing an active and competent role in online discussions is more highly valued, open publishing will no doubt achieve a breakthrough. Microsoft, for example, awards the title 'Most Valuable Professional' (MVP) to those people engaging actively and competently in online discussions and who voluntarily share their technical know-how with community members. Such an award is also conceivable for scientists.

One can only hope that, with time, scientists will change their minds and come to embrace the use of online resources for rapid sharing and discussion of their research. In the world of physics and mathematical research, the Cornell University-maintained pre-publication portal, ArXiv, has achieved great success in this respect. ♦

*The author can be contacted at
sduntze@b3c.de*