One-click science marketing

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Strong competition and funding squeezes require scientists to look for ways to increase their profile and impact within and beyond the scientific community. Online tools and services can help them communicate and publicize their research more effectively.

When supply exceeds demand, marketing becomes vitally important. Marketing — a "set of processes for creating, communicating, and delivering value to customers"[1] — helps companies distinguish themselves from their competitors. It is usually seen as a business activity, but the same principles can also be applied to academic institutions, research groups and individual researchers. Scientists produce peer-reviewed articles and other scholarly content, and their reputation is built up through these individual works. Today — very different from a generation ago — an ever increasing number of scientists compete for the attention of their peers, the funding institutions and the general public. Against this backdrop, creating good scholarly 'products' may not be enough, and marketing emphasizes that scientists should learn how to communicate their research more effectively. The easiest and often the only way for individual researchers to communicate with their target audiences is through online tools and services (Table 1). This Commentary takes a closer look at the possibilities such tools offer for communication and marketing in science.

Communicating with colleagues

We scientists communicate with each other every day — by e-mail, at conferences, on panels and through publications. Doing so makes us an active part of the research community, but it is also an opportunity to promote our work. Science is built on trust, and our success in getting invited to speak at a conference, finding collaborators or getting a job will depend on people who know us personally. Barbour and Bourne[2] have given a good overview of some of the factors that influence the reputation of a scientist, ranging from self-evident points such as diligently checking everything we publish, to more subtle ones, for example being open about conflicts of interest.

Science has become truly international and geographically dispersed, and most

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interactions with collaborators and close colleagues now happen electronically rather than in person. E-mail remains the standard method for electronic communication, and good e-mail etiquette — including the proper use of language and prompt replies[3] — will help build our reputation. Mailing lists, which were invented more than 20 years ago, can help get around two limitations of e-mail: the difficulty of having a conversation with a group of people, and keeping track of longer conservations involving many topics. Nevertheless, with the exception of particle physics[4] and a few other disciplines, they are still rarely used by scientists. Mailing lists can be set up and managed by the institution, or by researchers themselves by using services such as Google Groups. A filesharing service (Table 1) can help circumvent size restrictions of e-mail attachments and can track different versions of a document. Audio and video conferencing is a great extension of e-mail and phone.

When it comes to the wider scientific community, peer-reviewed publications continue to be the standard way to distribute knowledge and to build a scholarly reputation. Practically all papers are now published electronically, making the distribution both faster and cheaper. Although access to the majority of these papers is still restricted to subscriptions, preprint archives are popular in some disciplines (for example, physics and astronomy) and open-access policies are on the rise. Hence, in principle, it is easy for the community to evaluate published research, and the reception of these publications — both by formal citations and in informal discussions — will influence the reputation of the researchers involved in that work. The quality of the research is undoubtedly the most important factor in determining the 'success' of a paper. But other factors also play a role, and the authors can influence some of them — both before and after publication. According to a 2009 survey among scholars, the accessibility of an

article and the reputation of its authors are among the most important factors in deciding which articles to read from a set of publications about a particular topic[5]. The question whether a journal is widely subscribed to or whether it offers open access should hence play an important role in choosing the right one for manuscript submission. Although most researchers also spend considerable time thinking about the reputation of the journals they submit to, the 2009 survey suggests that this point is less important to readers.

Presentations at conferences or invited lectures can be just as important as scholarly articles in promoting research results; not only after the work has been published but also before publication to get informal feedback. Although the number of people that can attend these presentations in person is limited, the presentations can be made available to a wider audience by making them available electronically (via an institutional homepage or a specialized web service; Table 1). The main challenge here is not a technical one, but rather to not jeopardize the acceptance of an unpublished manuscript[6], and to avoid using copyrighted material without permission[7]. Some presentations are also recorded on video and made available on conference websites or via specialized services (see Table 1 and, for example, Philip Bourne's SciVee page[8]). Researchers can then link to these videos, or they can embed them into their own webpages.

Setting up a researcher profile

Institutions and funding organizations rely on CVs and the researcher's reputation within the community — assessed through panels and peer review — to make their funding decisions. To promote your work to this audience, you should make your CV available online, typically as researcher profiles on academic homepages[9]. Apart from contact information, group members, and the most recent publications, these profiles can also cover other aspects of your work, such as published research datasets, grants and teaching activities. To make sure interested visitors have immediate access to research results, profiles should link to the full text of papers on the journal website and/or institutional repository wherever possible. Using video and other media is a powerful strategy to engage homepage visitors.

> Outreach to a wider audience is increasingly seen as an integral part of science.

Unfortunately, more often than not researcher profiles are poorly connected to other resources and contain outdated information. Some academic institutions therefore use specialized tools such as VIVO[10], BibApp[11] or Harvard Catalyst[12] not only to build and maintain academic homepages, but also to facilitate the discovery of their researchers and potential collaborators within and across institutions using semantic web technology. If an institution doesn't provide appropriate academic homepages for their researchers, scientists can also set up a profile page with one of the many social networks for scientists (see Table 1 and, for example, Jonathan Eisen's page on Mendeley[13]).

Even with the tools mentioned above, maintaining a publication list still requires substantial effort. This should become considerably easier when the Open Researcher & Contributor ID (ORCID)[14] service launches in summer 2012. ORCID is a non-profit organization with support from over 300 participating organizations (including academic institutions, funding organizations and publishers) that will issue unique identifiers to all researchers. Journals will start asking authors for their unique ORCID identifier when they submit a manuscript, and this information will be forwarded to bibliographic databases when the manuscript is accepted. What's more, the ORCID service can also be used for other scholarly contributions such as research datasets. Provided their institutions support ORCID on their academic homepage, this will enable researchers to have their publication list updated automatically. This unique author identifier will make it much easier to collect the scholarly output of researchers, helping them to promote their work.

Reaching out to the general public

Outreach to a wider audience is increasingly seen as an integral part of science, and it is already being considered in funding reviews, for example, through the US National Science Foundation's *Broader Impacts Review Criterion*[15]. In some research areas outreach can even play a central role, for example, in citizen science projects such as Galaxy Zoo in astronomy[16]. A popular outreach strategy that can be followed by any researcher is writing a science blog, and there is a wide variety of topics, style and target audiences (for example, Rosie Redfield's microbiology blog[17], John Hawks' anthropology blog[18] or Cameron Neylon's open-science blog[19]). A researcher can start with a blog-hosting service (Table 1), through one of several science blogging networks, or through a blog hosted at their institution. Submitting the science blog to an aggregator such as ScienceSeeker can help reach a broader audience[20]. Twitter, Facebook and Google+ have become popular outreach tools, too, as they make it extremely easy to engage with large audiences.

However, stimulating and maintaining the interest of the general public requires good verbal and visual presentation skills and a fresh view on your own work. Scientists have to learn to generalize their research findings and not get lost

Table 1 | Useful online tools and services for scientists, the examples are either entirely free or available in a free version.

Marketing activity	Examples of online tools and services
Communicating with colleagues	Google Groups; http://groups.google.com Google Docs; http://docs.google.com Dropbox; http://www.dropbox.com Box; http://www.box.com Skype; http://www.skype.com Google+ Hangout; http://plus.google.com Figshare; http://figshare.com Nature Precedings; http://precedings.nature.com
Sharing presentations	Slideshare; http://www.slideshare.net Scribd; http://www.scribd.com YouTube; http://youtube.com Vimeo; http://www.vimeo.com SciVee; http://www.scivee.tv
Maintaining a researcher profile	ResearchGate; http://www.researchgate.net Academia.edu; http://academia.edu Mendeley; http://www.mendeley.com
Blogging	Wordpress; http://www.wordpress.com Blogger; http://www.blogger.com

in the details that are often the focus of a discussion with peers. Colleagues more experienced with the press, blogging and social media, and your institution's public relations department can help you along the learning curve, with every researcher having to find their own comfort zone. Finally, please don't even think about setting up a Wikipedia page about yourself as this would violate two important Wikipedia guidelines: neutral point of view and possibly also notability.

Market with care

Many of the online tools and techniques mentioned above can help increase the profile and the impact of a researcher, but you should always keep some important limitations in mind. First and foremost, the long-term success of any marketing strategy hinges on the quality of the product, and the main focus of every researcher should always be doing good research. Not all internet tools for scientists have been successful, and it is useful to hedge your

bets. To give one example, FriendFeed used to be popular with scientists 2–3 years ago[21], but it is used much less now. Moreover, all marketing activities should be coordinated with your host institution. Public relations policies differ between universities and institutions, and your local office can help with press releases and media contacts. Finally, it is important to keep in mind that using the internet for publicity can also do harm, for example, when discussing private information on social media such as Facebook or Twitter. Nevertheless, online communication tools already offer plenty of opportunities for researchers to disseminate and promote their work, and most importantly, to interact more closely with their colleagues and the public. ❐

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