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Comment

Collaborative Web between open and closed science

Alessandro Delfanti

The development of the Internet is closely related to the history of science. Not only because the web is born (also) at Cern in Geneva to allow research centres all over the world to exchange scientific data. Science, like many other human activities, has experienced the strong consequences of the technological revolution based on the Internet. The world of research, which is based on communication and on the exchange of information, now fully exploits the collaborative instruments that are at the core of the production of web contents we know as Web 2.0. In this commentary JCOM wants to provide an insight on some communication forms made viable by the web, both within the scientific community and between itself and the boundless community of users. Many of the instruments discussed in this issue of JCOM indeed contribute to changing the geographic frontiers of research, those among scientific disciplines and between scientists and other citizens. The past few years have seen the explosion of scientific data publication forms exploiting new IT technologies to put at everyone's disposal – in a quick, convenient and free way – the results of research projects. Scientific journals and open access archives are indispensable to online collaborative science, and the data they contain are the raw material the so-called "science 2.0" is based on. But even the most common instruments in the ecology of the web, such as blogs and podcasts, are finding their place in the debate on science.

In this regard, the use of the collaborative Web can be considered as a new expression of the historical characteristics of the "open" science. By open science we mean a method of production of scientific knowledge spreading its results by opening them to the revision of the entire scientific community. At the opposite extreme, there is a "closed science", a secret one or one in which communication dynamics are limited within the walls of an institution. However, the concept of science as a pursuit of "public knowledge", which today may appear as obvious, is actually the result of complex and stratified social and economic dynamics. [1]

Changes in contemporary science – which are closely linked to the innovations introduced by the use of the web – are making the picture more complicated. They put into communication not only the academic world with private research, but also the scientific fortress with citizens who debate on science, with or without scientists. These worlds are increasingly engaging in an inter-communication and the frontier between open and closed science should be now reconsidered: can the Web instruments really generate the collaborative non-hierarchical processes among peers that Yochai Benkler called "Commons-based peer production"?[2] Is public science communication more complex since when anyone can open up a blog and start talking about science with the world?

The open access journals of the group Public Library of Science are experimenting with PlosOne a form of "open peer review" of scientific papers which sees the participation of the entire community of researchers. As Bora Zivkovic reports, scientists can comment, correct and discuss the work of their colleagues, giving birth to a process of continuous revision of the published articles. In the future, scientific journals may contain papers of different styles and also be structured according to the links among different works, making science more multidisciplinary and intertwined.

Grid computing is a method to share not only information, but also the hardware and software instruments placed on the web. Stefano Cozzini has analysed for JCOM the development and the future potential of e-Science and of its shared infrastructures, also highlighting the critical points that are hindering its widespread adoption by scientific research. After having described and analysed some grid projects, Cozzini introduces also cloud computing, an approach to distributed computing promoted by some large international enterprises that is raising the interest of the world of research.

Any method to promote the collaborative character of science is the focus of the work by Science Commons, a branch of Creative Commons run by director John Wilbanks. In his comment, Wilbanks analyses the integration of scientific data through computerised databases. And he maintains that a

licensing system similar to the one of IT open sources does not always favour processes of integration and growth in e-science that fall within its social purposes. In some sectors, integration feeds on data that are public property without the intermediation of licenses based on the copyright system.

Coming to web instruments used for public science communication, Ilenia Picardi and Simona Regina present the results of a research on science podcasting. This type of participatory media based on spreading and sharing online audio material is analysed within the Italian context, but also at international level. The authors highlight the participatory and horizontal characteristics of a medium thanks to which everybody, scientists or web users, can access a user-friendly instrument and talk about science with their language, engaging in the public debate in a more direct way.

Finally, Elisabetta Tola presents a review of scientific blogs, a growing trend (as the data presented in this commentary clearly tell) which is gaining ground also within authoritative journals such as Nature, which has launched its network of blogs managed by scientists. Or like Seed, with the experiment of ScienceBlogs.com. Scientific blogs really are a hybrid media, used to talk to – or better to chat with – the general public, but also to exchange knowledge in an informal way with other researchers.

There could be many other examples, but the insights of this JCOM issue include a good sample of instruments and practices now changing the science communication processes. The web, an indispensable resource for contemporary science, is not only a technological instrument, but also a field in which different views on what science is and what its social purposes are collide. A field that lives on communication and that needs to be studied in a detailed way, without disregarding its contradictions and weak points.

Translated by Massimo Caregnato

Notes and references

[1] P.A. David, *The Economic Logic of "Open Science" and the Balance between Private Property Rights and the Public Domain in Scientific Data and Information: A Primer, Stanford Institute for Economic Policy Research*, discussion paper, March 2003.

[2] Y. Benkler, *The Wealth of Networks*, Yale University Press, New Haven and London 2006.