

STM position on Enhanced Science

A. Background and the concept of enhanced science

The continuing evolution of the application of digital technology to scientific communication and research fostered discussions in the science community about how this evolution affects the actual processes of science and research. The recent stakeholder consultation¹ of the European Commission (Directorate Research and Innovation and Directorate for Communications, Networks, Content and Technology) on 'Science 2.0'², stimulated STM to make its contribution to the debate by virtue of innovations supported by the publishing industry. Our position is set out below.

Whilst technology and innovation undoubtedly leads to "enhanced science", the fundamentals of the research process have remained intact. No '*paradigm shift*' has occurred and the *modus operandi* of conducting and organising research remains entirely unchanged, though enriched by the technological innovation which has occurred with the widespread adoption of the Internet. With the advent and development of new innovative digital tools, scientific publications (articles and long-text formats such as books, book series, reference works, textbooks etc.) are morphing into smart but complex objects with data, web links, dynamic commenting, related blogs, wikis and videos. These technological developments allow an easy, seamless and cooperative sharing of information among scientists.

The research discipline has always drawn from the tools and technologies around it to enhance its methods for the most rigorous application of science. Likewise publishers have always sought to disseminate the results of scholarly research as widely as possible. Therefore, it would be inaccurate to suggest that the fundamentals of the practice of scientific is now somehow different, or to claim that a '2.0' version of doing science now exists to the exclusion of all others.

B. STM Position on Enhanced Science

STM publishers strongly support all innovations in this area, but do not believe that the established methods of conducting and organising science have changed. The fundamental elements in a scientific method are observation, measurement, and experiment, and the formulation, testing, modification and verification of a hypothesis. In practical terms those elements are translated and executed in process-driven actions during the research method. Only with the right techniques and a thoroughly planned research process will science deliver meaningful results.

The STM publishing industry offers a wide range of services to researchers and supports them in the publication of their findings. The current scholarly system empowers researchers with a

¹ <http://ec.europa.eu/research/consultations/science-2.0/questionnaire.pdf>

² Definition of 'science 2.0' in the EU Consultation: *the ongoing evolution in the modus operandi of doing research and organising science. These changes in the dynamics of science and research are enabled by digital technologies and driven by the globalisation of the scientific community as well as the need to address the Grand Challenges of our times. They have an impact on the entire research cycle, from the inception of research to its publication, as well as on the way in which the cycle is organised*

wide choice of where to publish as well as the opportunity to utilise new digital services to enhance the dissemination of their research to a wider audience.

1. Science trends

Innovations made available and supported by STM publishers such as the DOI³, ORCID⁴, article⁵ of the future, commitments on TDM⁶, have had a great impact how information is being shared today. The fundamental improvements in the underlying technology behind journal articles and in long-text-formats publications have given rise to semantically enriched objects. The importance of the social web, when the reliability, trustworthiness and efficacy of the information available via these channels is still being debated, implying less of an emphasis on their role in the overall structure of the current research process.

2. Key drivers: Is policy intervention required?

STM supports any method of doing science and does not favour one over the other. Nevertheless, there seems to be no precise distinction between 'Science 2.0' and the established methods of science. Equally there is no distinction between the impacts and implications between any differing methods of carrying out science. Therefore there are only drivers and implications for science as such, and these cannot be specifically attached to 'Science 2.0'.

STM's view is that there is no need for any policy intervention into the research industry and its processes. The community and its stakeholders alone should discuss, develop and decide what and how the process of performing science looks like.

Any exercise designed to raise the awareness of science should focus on it as a discipline. Adopting a narrow view of particular types of scientific process and practice does not engender the wider overall visibility which the field requires.

3. Opportunities and barriers

Copyright law is not a barrier to the development of new services and innovations across the sciences. Instead it is an enabler that allows for such services and developments to be made in the first instance. Licensing options are strongly recommended by STM and the way forward to extend the use of digital published content whilst ensuring both for quality and a sustainable future.

4. Research metrics and quality assurance

The Internet has allowed for the proliferation of a multitude of new metrics designed to assess the quality and performance of science. These are for now unlikely to replace the existing metrics of citations though do and will add valuable new dimensions. For this reason many academic publishers have already started to include alternative metrics as part of their information services to authors alongside traditional measures.

C. Conclusion:

³ DOI: digital object identifier; <http://www.crossref.org/>

⁴ ORCID: Open Researcher and Contributor ID; <http://orcid.org/>

⁵ <http://www.articleofthefuture.com/>

⁶ <http://www.stm-assoc.org/text-and-data-mining-stm-statement-sample-licence/>

STM publishers are agnostic as to how science is carried out. STM publishers are a supporting industry, and their aim is to support and provide services to scientists and researchers in the best way possible to facilitate scholarly communication. STM publishers embrace new ways of interaction and communication, but making policy interventions to support alternative ways of doing science should not undermine other models with their own tried and tested benefits

The International Association of Scientific, Technical and Medical Publishers ("STM") is the leading global trade association for academic and professional publishers. It has over 120 members in 21 countries who each year collectively publish nearly 66% of all journal articles and hundreds of thousands of monographs and reference works. STM members include learned societies, university presses, private companies, new starts and established players.

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