

## EUROPEAN PERSPECTIVES

# Open Science for an Open Society

Towards a Global Virtual University

**Recent initiatives by the scientific community have triggered an important debate in Europe on the “scientific information value chain”, and in particular on the ways technology is impacting how scientific information is stored and accessed, and the role of intermediaries in a flatter world.**

The digital revolution is having a profound impact on industry, government and citizens. Access to and reuse of scientific information in digital form is critical for European economic competitiveness. Throughout the economy and society, the business models and activities of intermediaries are being called into question, as technology can now bring together directly the buyer and seller, supply and demand. Digital information is the ‘prima materia’ triggering rapid societal and economic transformation, playing a similar role to energy in the earlier transition from agricultural to industrial-based societies. The challenge is to ensure that in this new digital world we are able to store and preserve adequately the huge volumes of scientific information upon which our societal and economic activities rely, while at the same time ensuring widespread and non-discriminatory access to scientific information by those that need it.

Europe has the obligation to preserve the ever growing quantity of scientific information generated and exchanged in all domains of science, both for current science and for the benefit of future science. Long term digital preservation relies on the existence of trustworthy places to store – such as storage warehouses distributed across different geographies – but also on the ability to retrieve information, to further process and to manage all such information in order to ensure its recovery. This is a non-trivial challenge in the scientific context. The nature of science is such that we do not necessarily know the future questions, let alone the future an-

swers. So providing for future-proof archiving and recovery of scientific information is at best a considerable practical challenge and at worst a philosophical impossibility.

While storage per se is a challenge issue due to the sheer volumes and complexity involved, it is equally important to ensure interoperability between repositories, and envisage their high-speed and high-capacity interconnection. It is clear that we need to address also the issue of open access. Science in the digital era relies on the instantaneous and free flow of ideas and unlimited access to the underlying information and data supporting and validating these ideas.

Europe needs to address urgently the strategic issues of storage, preservation and access to its digital heritage, and this is as important for science as it is for culture, art or history. It is



*Tsunami buoys are being used for measuring changes in the ocean waves. Early warning systems are one example for research collaboration on a global level.*

urgent because the world is changing around us. Today, we are about to create a Global Virtual University without really realising it. 30 million researchers worldwide are now connected to GEANT, the European electronic research network. Activities as diverse as global early warning systems for the effects of tsunamis in South East Asia, global research in high-energy physics, key-hole surgery in Vietnam, and global radio-astronomy projects in China, are not only possible but are happening today. Research is thriving in its new virtual world, and researchers are demanding open science, whether they are on the 23rd floor of the new IT tower at Tsinghua University in Beijing, in the beautiful new library in Alexandria, or surrounded by the wonderful historical libraries of a Cambridge college.

Availability of open digital scientific information requires decisions to be taken in a long-term perspective, to avoid for example situations in which technology is not available or is not maintained due to lack of provider interest. Open standards must be agreed to address the issues related to infrastructures for storage and connectivity. Open interfaces are needed to allow for user-friendly access to and distribution of scientific information and to facilitate the development of new functions to add value to science, education, learning and innovation. But equally important, Europe needs to stimulate the debate on open access to the scientific information itself, and on the suitability of the business and value generation models of the past, to solve the problems of the future.

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*The views expressed in this presentation are those of the author and do not necessarily reflect the views of the European Commission.*