Making information resources more usable

A position paper on the management of research data in the Helmholtz Association[1]

Research data provide the foundation for research processes and in many cases also for economic and social innovation.[2] The ways in which research data are used are changing fundamentally as a result of the digital revolution and the open science movement. The sharp increase in the amount of digitally available data – including research data – and the ever-increasing speed with which they are generated is opening up new potential for science and industry alike. Use of these data calls for extensive investment in the expertise, research and infrastructure needed to manage and analyse them. Also required is a transformation of scientific culture and of the business models on which the publishing of texts, data and software is based; it is this transformation that is termed "open science". The Helmholtz Association's infrastructure for the management of research data already provides important national and international hubs.

In 2003 the Helmholtz Association was among the first signatories of the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities.[3] Industrialised countries[4] and the European Union now class ensuring open access to research data as part of their core strategy. The German federal government, too, regards this policy as a key instrument for successful positioning in the competitive global scientific arena. Establishing a national research data infrastructure as a component of globally distributed information infrastructures for science is a top priority in the Council for Scientific Information Infrastructures' recommendations[5] to the federal

> **MISSION of the Helmholtz Association**
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> We contribute to solving grand challenges which face society, science and industry. We do this by performing top-rate research in strategic programmes (through the mechanism of programme orientated funding, or POF) in the fields of Aeronautics, Space and Transport, Earth and Environment, Energy, Health, Matter and Key Technologies.
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> We research highly complex systems using our large-scale scientific infrastructure in close cooperation with national and international partners.
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> We contribute to shaping our future by combining research and technology development with a vision for innovative application in tomorrow's world.

1   This text was produced by the Open Science Working Group and passed by the General Assembly on the 22nd of September 2016.

2   Science Europe Roadmap, December 2013.
    http://www.scienceeurope.org/uploads/PublicDocumentsAndSpeeches/ScienceEurope_Roadmap.pdf

3   https://openaccess.mpg.de/Berlin-Declaration

4   G7 Science and Technology Ministers' Meeting: Tsukuba Communiqué, 17 May 2016
    http://www8.cao.go.jp/cstp/english/others/20160517communique.pdf

5   Council for Scientific Information Infrastructures (Rat für Informationsinfrastrukturen): Performance through Diversity, 3 May 2016
    http://www.rfii.de/en/category/documents/

government, the German states, and scientific organisations. The Helmholtz Association will play a leading role in setting up this infrastructure, coordinate the activities of its Centres, and make recommendations on the management of research data.

In light of the potential of research data and the changing ways in which they are used, the Helmholtz Association believes it is crucial to develop this position in ways that will enhance and capitalise on the interdisciplinary expertise of its research areas.

In keeping with its mission, the Helmholtz Association will, by strengthening its "digital science", significantly enhance the potential of the information and research findings that are obtained. To achieve this it will:

- foster focused research in the field of information technology and pursue the development and operation of corresponding information infrastructures for scientists at its Centres, for its cooperation partners, and for the users of the research infrastructures that it operates;

- store research data from the Centres within suitable data infrastructures and make them available openly and free of charge for subsequent use by science and society;

- play an active part in national and international initiatives to coordinate the establishment of the necessary infrastructures; and

- provide training to enable scientific and non-scientific staff to utilise the opportunities thus created.

The Centres are agreed that, in keeping with the recommendations of the *Council for Scientific Information Infrastructures* for the federal government and the German states, this will enable them to:

- further stabilise the financing mechanisms for data infrastructures;

- further improve the coordination and networking of their distributed data infrastructures within Helmholtz, nationally and internationally;

- further promote a new data culture; and

- expand human resources.

As a first step, the Centres will specify the details of this research data management in publicly accessible guidelines.[6] There may be legitimate – and sometimes discipline-specific – reasons for the temporary withholding or permanent strict control of access to information, for example in order to protect personal data, the rights of third parties, or the carefully considered interests of the researchers concerned. In specific cases, it may also be necessary to consider restricting subsequent commercial use, which should in principle be permitted.

The Centres will advise scientists on the responsible and effective management of research data. They will develop and operate reliable research data infrastructures to facilitate the safeguarding and use of internally and externally acquired research data. The Centres will work together in this process and cooperate nationally and internationally with other institutions and initiatives.

These principles are intended to promote the quality, productivity, sustainability and competitiveness of science, in keeping with the mission of the Helmholtz Association. They also provide a basis for knowledge transfer. The principles apply to staff at the Centres and to external users of large-scale devices and infrastructure operated by the Centres.

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6   All member Centres need to have established guidelines by the end of 2017. Formulation of the discipline-specific details is expected to take some years. The Helmholtz Association's Open Science working group is drawing up recommendations to assist the member Centres in formulating those guidelines.