eScience as Challenge for Research and Libraries on the Way to an Epistemic Web

International Conference on “Science 2.0”

Urs Schoepflin
Director, Research Library
Max Planck Institute for the History of Science

Neural networks in the human brain

Hamburg, March 26, 2014
Max Planck Institute for the History of Science

About the MPIWG

Founded in 1994, the MPIWG in Berlin is one of the more than eighty research institutes administered by the Max Planck Society. It is dedicated to the study of the history of science and aims to understand scientific thinking and practice as historical phenomena. Researchers pursue an historical epistemology in their studies of how new categories of thought, proof, and experience have emerged.  

Projects and Sources

Research at the MPIWG is carried out in individual and collaborative projects. To browse through the projects, use the keyword index of the institute.  

The MPIWG is an advocate of open access to scholarly knowledge and is committed to making sources in the history of science available online.  

News

Lorraine Daston, Executive Director at the MPIWG, is interviewed by Klaus Tachler about new ways of reading.  


New Articles and Preprints


New Books

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Where are we?

• ...
• „World Wide Web“
• „Semantic Web“
• „Digital Libraries“
• „Open Access“
• „eScience“
• „eContent“
• „Science 2.0“
• „Big Data“
• „Social Media“
• „Digital Humanities“
• ...

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These are the answers.

But what was the question?
Overview

• Looking back: Where are we?
• The Scholarly Perspective
• Research Challenges
• Conventional Vision
• Expansion of Knowledge and its Fragmentation
• Alternative Vision
• Open Access
• Dynamic Documents
• Outlook: Further Challenges

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Challenges of the Web for Research

- Development of knowledge
- Collective creation of knowledge in the sciences and humanities
- Continuous transformation and renewal
- External representations of common knowledge
- Confrontation with the experiences of traditional media
- Unsufficient exploitation of the potential of the new media for research

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Heading for new shores...
Traditional Knowledge Economy

- Separation of research and dissemination
- Data are confined in static representations
- Only selective representations of research results
- "Information-Hinterland"

Research project on Intuitive Physics

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Growth of Knowledge and Fragmentation

- “Information Explosion” as a result of fragmentation of bodies of knowledge due to their unsufficient integration
- Traditional publication system is fostering fragmentation of knowledge representations
- Collectively created knowledge is turned into private ownership
- Reflected by the shape of academic careers

Cover of M. Valleriani, Galileo Engineer, 2010

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Alternative Vision of the Knowledge Cycle

- Integration of research, dissemination, and reception
- Research results become immediately basis for new research
- Dynamic representation of knowledge

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Precondition: Open Access

• Arguments for open access
• Comprehensive representation of the „Information-Hinterland“

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Open Access Policy

“Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the open access paradigm via the Internet have to be supported. We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community.”

Max Planck Society, “Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities”, 2003

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Towards an Epistemic Web: Open Access Research Environment „ECHO – Cultural Heritage Online“
http://echo.mpiwg-berlin.mpg.de

- Representations of cultural heritage made openly available:
  - ca. 890.000 high resolution images;
  - 9 multilingual dictionaries;
  - ca. 57.500 structured xml-filltext transcriptions;
  - databases with more than 250.000 items;
  - 240 video sequences

- Technology development:
  - development of open source tools (XML-based language technology for annotation, morphological analysis, search, and dictionary access, image server, annotation tools for multimedia)

- Open Access Policy
- Network of 170 content providers from 24 countries worldwide

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Towards an Epistemic Web: Online Availability of Sources

- Transparent research process by immediate verification of scholarly interpretation
- Creating a new situation for peer reviewing

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Cuneiform Digital Library Initiative: Open access journal with links to scholarly data and primary sources (http://www.cdli.ucla.edu/)

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Towards an Epistemic Web: Dynamic Representation of Knowledge

- Transcend static representations of knowledge
- Structural correspondence between content and representation
- Development of tools for analysis and interpretation of so far isolated data collections

Creating virtual knowledge spaces: “Pratolino: The History of Science in a Garden” (http://pratolino.mpiwg-berlin.mpg.de)

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Overcoming the Separation of Digital Object und Metadata in an Epistemic Web

- Current situation is result of traditional concepts, e.g. for digital libraries
- Enhancement: Metadata become research data
- Integration of analytic (linguistic) tools into editing workflows & research scenarios

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Overcoming the Separation of Digital Object und Metadata in an Epistemic Web

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Outlook to Further Challenges

• Quality control of non-finite documents
• Trusted content
• Recognition and credits
• Curation of living documents, metadata, and primary data
• Long-term availability
• Management of flexible collections
• New skills and qualifications for librarians
• Towards a vision of new models of research libraries

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Thank you for your attention!

Urs Schoepflin
Mail: schoepfl@mpiwg-berlin.mpg.de

Max Planck Institute for the History of Science
Web: http://www.mpiwg-berlin.mpg.de
     http://echo.mpiwg-berlin.mpg.de