

Position Paper

A global Digital Roadmap

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The shared challenge of long-term preservation

Keeping our digital information for current and future use is a cornerstone of the Information Society. Even though we have massive global information systems, digital preservation is still a major challenge for our generation. The transition from research and pilots to large-scale operational long-term preservation has been slow. Finding sustainable economic solutions to safeguard the digital output of public and private sectors requires close collaboration between governments, industries and memory institutions. Creators and consumers are important stakeholders as well. UNESCO's Charter for Digital Heritage highlighted this need for broad co-operation a decade ago:

Preservation of the digital heritage requires sustained efforts on the part of governments, creators, publishers, relevant industries and heritage institutions. In the face of the current digital divide, it is necessary to reinforce international cooperation and solidarity to enable all countries to ensure creation, dissemination, preservation and continued accessibility of their digital heritage. Industries, publishers and mass communication media are urged to promote and share knowledge and technical expertise. (article 11)

Transformations

In 2010, the quantity of information transmitted globally exceeded 1 zettabyte (10^{21}), and it is expected to double each year. Internet traffic has risen 13,000% in the last decade and the amount of new digital content created in 2011 is several million times the information contained in all the books ever written. Data centers capable to store exabytes (10^{18}) of information are being built around the world. To put it in perspective: just 400 terabytes (400×10^{12}) would be needed to store all books ever written in any language. In addition to this massive growth in the volume of knowledge held in digital form, governments across the world are increasingly committed to working digitally, so that the legal, administrative, financial and other information upon which governments and citizens depend is in highly vulnerable, fragile digital form.

Traditional concepts of authorship, ownership and privacy have broken down in the new information

environment, and the fundamental concepts of quality, integrity and access are not widely recognised as essential requirements of the digital environment. Digital content is being created at an unprecedented pace, is crowd-sourced, computer-generated, re-mixed and shared. Technologies have transformed the traditional information chain, challenged established business models and regulatory frameworks while facilitating new sources of competition and new access models.

Digital amnesia is everyone's concern

The rapidly changing global information environment is fragile. The enormous speed at which technological changes happen leaves us with discarded file formats, outdated software, obsolete storage media, old fashioned hardware. The loss of authenticity and integrity of content is a significant problem. We may be able to save lots of bits, but we risk losing their value, context and meaning in the process. We are also losing the content itself, as large volumes of essential information are not being captured and preserved and can be either lost entirely or become untrustworthy in a short period of time. The recent termination of commercial cloud services (the termination of Geocities by Yahoo is an interesting example) shows that loss of data is not a fictitious risk.

Data loss may have serious repercussions for an organization or society at large. It could mean the loss of valuable research outcomes, removing an organization's competitive advantage. Or it could result in the disappearance of crucial audit trails and evidence, with direct financial and legal consequences for any regulated organization. Data loss hinders full democratic control of governments and public institutions and brings about the erosion of citizens' rights. The societal and personal memory and our understanding of the recent past in general is at stake if the data generated by social and other media are not saved for future use as part of our heritage. Data loss may preclude the ability to monitor worldwide health, economic, environmental and weather patterns. Therefore digital preservation is inextricably linked to modern information management. Action is needed to ensure continuing, meaningful access to reliable digital information for as long as it is required.

Stakeholders in digital preservation

Digital preservation is based on two main solutions: 1) open formats and standardization for the safeguarding of the data and 2) systems and services to maintain the integrity of the data over time. Both solutions require close collaboration between ICT-industry, governments and memory institutions, e.g. in policy frameworks and preservation practices. Development of digital preservation services to keep information available for current and future generations is currently driven by a small group of memory institutions (i.e. libraries, museums, archives, data repositories), research organizations and private companies. Funding of this research is supported by policy-making bodies such as the European

Commission and governmental bodies around the world. It seems that, even though the Information and Communication Technology market continues to grow rapidly, a clear case for the commercial potential for system and service development to support digital preservation has not yet been identified. A brief survey among memory institutions shows that there are many good examples of public-private co-operation, but these relationships are mainly on a 1-to-1 basis (vendor-client), developing preservation systems, tools and services. As there are few certified public preservation services currently, the overall growth of the commercial marketplace for digital preservation is still relatively small. In some cases memory institutions have taken up the challenge themselves and have stepped into the market place to offer preservation services to partner institutes. There is however an emerging engagement in digital preservation in other market sectors such as finance, insurance, healthcare and the oil industry. Protection of digital information has a commercial value; international research and developments depend on the availability and integrity of reliable information. Long-term availability of information and the value of data could be a driver for a sustainable business in the ICT-industry.

The extent to which government can influence decisions at the moment of the creation of a digital object, and therewith enhance the change of its long term preservation, varies considerably according to the type of material at hand. Its influence can be considerable in the case of archival records, but it is less when it comes to scientific materials and almost nil for the products of culture and business.

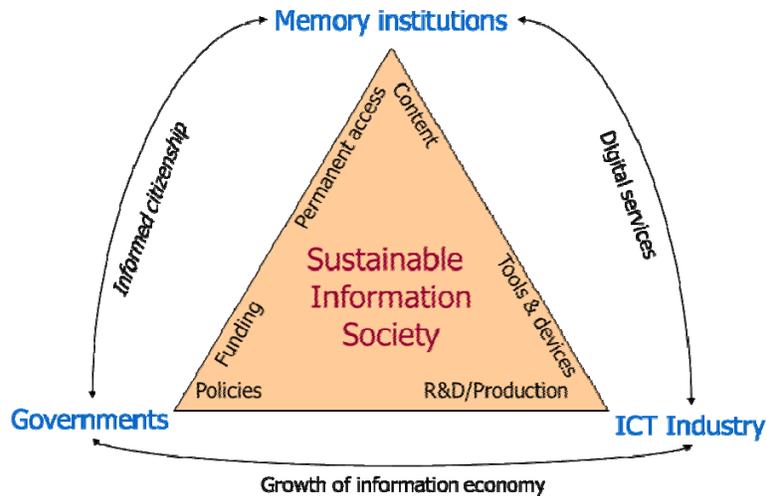
Sustainable information society

With ICT becoming more and more ubiquitous, it is desirable that governments, the ICT Industry and memory and research institutions build stronger relationships to avoid massive digital amnesia. Open government and access to public sector data are aimed at supporting citizen-focused public services. Memory institutions play a vital role in capturing and preserving digital content of administrative, historical, scientific or cultural significance for posterity. The ICT-industry transforms the global information economy by creating new technologies, and benefits from reliable information services and trustworthy content. In a hyper-connected world, continuous access to information becomes the gateway for health, education and employment resources as well as social, political and economic freedoms. A billion new Internet users in developing countries will change the landscape of the online world. Existing policy and legal frameworks (copyright and legal deposit legislation, for example) which guide preservation practices in the analogue environment will need reform to keep pace with evolving, and expanding, digital preservation needs. Creating a sustainable and transparent information society is a shared responsibility.

The following visualization describes in a generic way the nature of the relationships between the three parties that are directly involved in the UNESCO Roadmap (the triangle) and the values that are being

created in the process (the curved arrows).

Unesco roadmap relationships



The UNESCO Roadmap

The Vancouver Declaration of 2012 stresses the need to use UNESCO's convening power to establish a permanent dialogue between the major stakeholders to boost digital preservation solutions:

there is a pressing need to establish a roadmap proposing solutions, agreements and policies, that ensure long term access and trustworthy preservation. This roadmap should address issues like open government, open data, open access and electronic government. It should dovetail with national and international priorities and be in full agreement with human rights.

Under the aegis of the Memory of the World programme, UNESCO, IFLA, ICA and other organizations are jointly organizing a high-level meeting in The Hague to take the first steps to recognise the shared responsibilities. By drafting a global roadmap for digital preservation, UNESCO and the associated organizations intend to work on a priority set of issues and make progress toward issues:

- A common ground for the use of open standards
- A set of good-practices in public-private partnerships and leverage of the work already done
- Policy and legal frameworks to support digital preservation
- The use of cost models in order to be more predictive on the costs of digital preservation
- A common ground for sustainable Business models
- Defining high-level requirements for digital preservation and digital preservation services

- Awareness raising and engagement of the industry, government and heritage institutions.

Resources

Many thanks to all the great colleagues for their detailed responses to the survey questions and draft versions of the paper within a very short time.

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