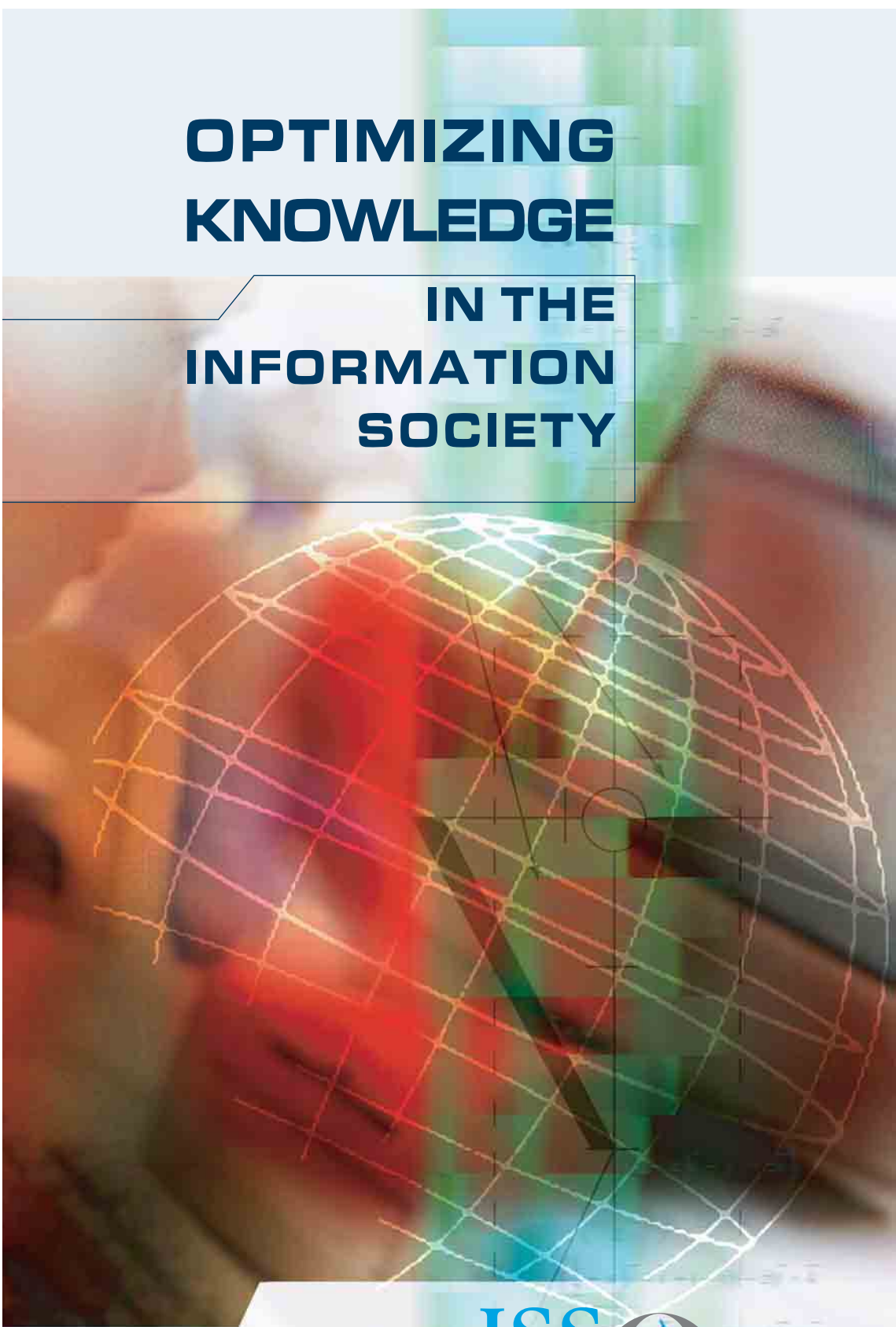
OPTIMIZING KNOWLEDGE IN THE INFORMATION SOCIETY



ISSC International Social Science Council

ICSU International Council for Science

>> KNOWLEDGE AND INFORMATION

Knowledge - in whatever field - empowers those who create and possess it with the capacity for intellectual or physical action. Knowledge is fundamentally a matter of cognitive capability, skills, training and learning.

Information, on the other hand, takes the shape of structured and formatted data that remain passive and inert until used by those with the knowledge needed to interpret and process them.

Scientific knowledge is knowledge that has been legitimized and validated by a systematic scientific research process. Science has a built in dynamic regarding the improvement of knowledge. Other forms of knowledge (experiential knowledge) also enable action but are not recognised as having the same properties in terms of proven reliability and generality.

Experiential knowledge may be traditional or modern. It is frequently specific to a local context and is acquired through individual and collective learning. Experiential knowledge has often not been systematically validated or tested but is nevertheless dynamic and is used by all of us in our daily lives. Such knowledge must not be confused with pseudo-science, which is largely static - changing only in opposition to systematic science - and has no societal benefit.

A KNOWLEDGE SOCIETY IS

- **a society in which the production and dissemination of scientific information and knowledge function well, and in which the transmission and use of valuable experiential knowledge is optimized;**
- **a society in which the information of those with experiential knowledge is used together with that of scientific and technical experts to inform decision-making.**

authored by Dominique Foray; www.dauphine.fr/imri/Foray/Dom.html

CHALLENGES

The conditions for producing and organizing knowledge are being dramatically transformed by the speed of its creation, the decentralization of participation, and the inclusion of diverse actors. These changes have major implications for society as a whole and realizing their full benefit **will be dependent on the establishment of optimal social, institutional, and economic conditions.**

Challenges include:

- **Knowledge integration:** Knowledge tends to fragment as it becomes complex and specialized. Knowledge fragmentation makes it difficult to form a broad and integrated perspective. This can be a source of inefficiency and ignorance at the local-level and have serious consequences at the level of global policy-making.
- **Memory:** We are often no longer saving paper documents but sets of instructions that need to be interpreted, managed, and presented by the right hardware and software. As a result, any lack of attention paid to complementary components of a knowledge system (continuity of languages, programs enabling access to older files) runs the risk of irremediably altering society's overall memory.
- **Certification and validation:** New methods need to be devised to certify the information circulating on the internet within a context where inputs may no longer be subject to the quality control and peer-review mechanisms associated with paper publications.
- **Moving knowledge across boundaries:** Transfer of knowledge between different institutions, sectors or cultures can be difficult to implement.

The knowledge divide

North-south knowledge divide: universal access to information on the www will not in itself solve the knowledge divide. Transforming the contents of the web into relevant knowledge that has social and economic value requires capacity building at both the individual and institutional level.

The privatization of knowledge: The excessive use of intellectual property rights (IPR) can inhibit innovation and development. This is a particularly important issue where the free-flow of scientific information is concerned.

The difficulty in fully realizing the benefits of experiential knowledge: Experiential knowledge is in many situations an important complement to scientific knowledge. A better understanding and integration of experiential and scientific knowledge is crucial to fully address the Millennium Development Goals.

ACTIONS REQUIRED

>> **Increase the use of ICTs to support the integration of countries, communities and individuals into the knowledge society** and to promote collective action and social learning. ICTs provide not only a good information repository, but also the infrastructure for knowledge dissemination, distance learning and remote access. As such, they are valuable tools for the creation and expansion of virtual knowledge communities that bring together both scientific and experiential knowledge.

>> **Encourage cooperation between scientific research and other knowledge holders.** Citizens have expertise on many issues. They have important experiential knowledge and the optimal utilization of such knowledge is necessary to fully address key priority areas for sustainable development: water, environment, health, agriculture and biodiversity.

>> **Promote institutional mechanisms to protect the public domain of information from the excesses of privatization.** Reconstructing the research and intellectual commons is necessary in order to mitigate the adverse effects of a highly protectionist intellectual property environment.

>> **Strengthen the proven knowledge infrastructures (libraries, archives and museum: LAM) as a necessary complement to the WEB and create new economic rationale to support them.** For centuries, the LAM have operated as a public good supported by public funding and/or the patronage structure of non-profit philanthropies. The method of measurement of the contribution of the LAM to social welfare has been very crude. The rise of the Internet as a competing source of information necessitates more rigorous evaluation methods.

>> **Promote educational and training programs to help people acquire the skills that are necessary to prosper in a knowledge-based economy.** Knowing how to manage information and knowledge is essential and recognizing it as such, makes it possible to deduce a number of generic skills that everyone needs to develop: sharing, sorting and memorizing, communicating, codifying, retrieving, etc.

>> **Develop research** to improve our understanding of many issues related with the production, transmission and effective use of knowledge. Very few countries have taken this challenge seriously. For example, relatively few young social scientists are developing the expertise or experience necessary to address the complex challenges of ICTs in the knowledge society.

The knowledge infrastructure: the LAM and the web

Societies have built and sustained institutions to collect, organise, preserve and provide access to knowledge-bearing objects for more than two millennia. It is important to recognise the continuing significance and role of these institutions - libraries, archives and museums (LAM) - in the knowledge age. The LAM, the Web and market forces are complementary in four key areas:

- **access:** while information and communication technologies (ICTs) create opportunities to facilitate access to information, libraries still serve as equalisers in disparities of access to by providing free access to materials that individuals cannot afford to purchase;

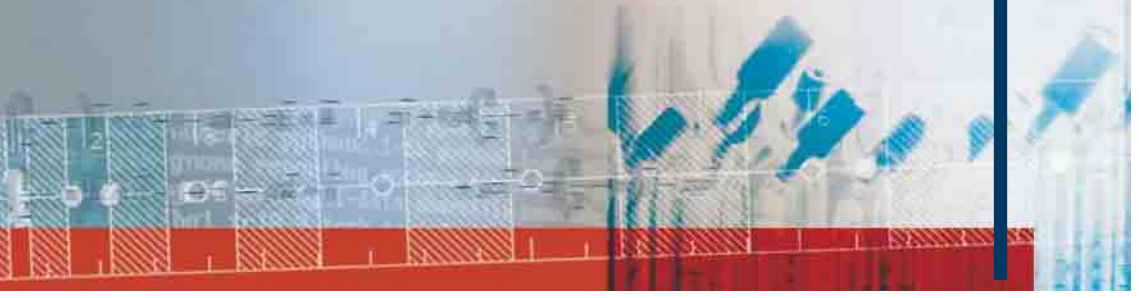
- **quality assurance:** the Web is easy to use and provides fast access to a vast amount of information. However, the quality of this information is very variable. The role of the LAM in ensuring access to high quality information is, therefore, crucial in educational and research activities;

- **social memory:** an essential function of the LAM is the accumulation and preservation of knowledge that might someday be of vital importance; a function that the Web cannot take up;

- **information property:** while some copyright restrictions on digital content have become so limiting that they risk being counter-productive to innovation and knowledge generation, one fundamental social function of the LAM is to preserve a large public domain of information.

Enhancing interactions

Significant benefits can accrue when citizens, who have specific and specialised knowledge, are put in position to effectively participate in the process of research and decision-making. Health is a good example of an area in which non-specialists unquestionably possess experiential knowledge that complements scientific investigation and where the inclusion of patient groups in policy making is already occurring. Participatory approaches, involving close collaboration between lay persons, scientists and decision makers are also being increasingly adopted in areas such as environmental research and education.



SCIENCE IN THE INFORMATION SOCIETY

In March 2003, more than 60 invited experts—leading scientists and representatives of international organizations—gathered at UNESCO in Paris to consider the role of science in the information society. Participants developed an overall **Agenda for Action** for consideration by all parties interested in using information and communication technologies (ICTs) for a better society.

AGENDA FOR ACTION

>> Ensure that all universities and research institutions have affordable and reliable high-speed Internet connections to support their critical role in information and knowledge production, education and training.

>> Promote sustainable capacity building and education initiatives to ensure that all countries can benefit from the new opportunities offered by information and communication technologies (ICTs) for the production and sharing of scientific information and data.

>> Ensure that any legislation on database protection guarantees full and open access to data created with public funding. In addition, restrictions on proprietary data should be designed to maximize availability for academic research and teaching purposes.

>> Promote interoperability principles and metadata standards to facilitate cooperation and effective use of collected information and data.

>> Provide long-term support for the systematic collection, preservation, and provision of essential digital data in all countries.

>> Promote electronic publishing, differential pricing schemes, and appropriate open source initiatives to make scientific information accessible on an equitable basis.

>> Encourage initiatives to increase scientific literacy and awareness of how to interpret web-based scientific information.

>> Support urgently needed research on the use of information technologies in key areas, such as geographical information systems and telemedicine, and on the socio-economic value of public domain information and open access systems.

>> Recognize the important role for science in developing and implementing the new governance mechanisms that are necessary in the information society.

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Founded in 1931, ICSU is a non-governmental organization representing a global membership that includes both national scientific bodies (101 members) and international scientific unions (27 members).

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Founded in 1952, the ISSC is a non-governmental organization representing the social sciences at the global level, with 60 members including national and regional social science bodies, as well as international professional associations of major disciplines.

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