Institutional Design of Global Information Commons for Asia

Shuichi IWATA, Krishan LAL and Baoping YAN........

CODATA(UT-Japan/NPL-India/CAS-China)........

Brief History(1)

- Tragedy of Commons
  - Free rider/invisible hand(fist)/laissez-faire
  - WTA/Advantages of backwardness
- Tragedy of Anti-Commons-Too much IPR

- From Idealism to Realism
  - From Scientific Productivity/Social Well-being/Win-Win to Incentives/Competitions
  - ....
- From Theory to Implementation
  - Stability/Optimization-Path Dependency/Locking-in/Scrap & Build/Revolution/Emergence

Brief History(2)

- ICSU/CODATA UNESCO Symposium 2003 March
- J.Lubchenko and S. Iwata:"Science and Information Society", Science 301, 12 September 2003, 1443.
- WSIS Geneva 2003 December
- CODATA 2004
- CODATA UNESCO Symposium 2005 September
- S. Iwata and R. Chen : "Science and the Digital Divide" , Science 310, 21 October 2005, 405.
- WSIS Tunis
- CODATA 2006
- the 7th Science Council of Asia (SCA) Conference
- CODATA 2008

From Industrial Capitalism to Where?

- Knowledge-based economies but diversities in culture, religion, civilization, nature and people.
- Data-guided managements are required due to interactions of people.
- Well-balanced views for benefit of all through multiple information networks to develop strong ties between partners.
- Collaboration across national and organizational boundaries to reach future goals by sharing and using information commons, keeping each cultural identity.
- ....
- ....
- ....
- Freedom and equality in using scientific data for better life.

Increased Data Intensity Now

- Bio-informatics, material informatics, e-health, ..., digital earth.
- Cyberinfrastructure in USA, e-Science in Europe, e-Infrastructure in Japan, ..., *what in Asia*.
- Our complex, developing and evidently different societies-*Asian diversities and potentialities*.
- We need to share important data
  - to work together
  - to help each other
  - to trust each other
  - to respect each other
  - to find solutions for themselves.

To attain well-being of people by using "information commons"as Vehicle of Development

- Technical, economic, policy and legal/institutional barriers and obstacles discouraging data and information sharing and exchange, but........

- Open access and reduced costs of data and information exchange through the institutionalization of open standards and rules, that is, "information commons";

- Incentive structure of relevant actors involved in creation, distribution, and use of databases-for scientists;
  - not only importance of reputation, recognition, and promotion among academic communities
  - but also commercial profits, which would be influenced by the existing legal and administrative regimes
  - openly and freely available digitally and online, frequently facilitated by common use licensing

- Designing of intellectual infrastructure for utilizing many different types of data and information collaboratively among institutions and researchers for common goals with "missions";

Science and the Digital Divide

At the launch of the World Summit on the Information Society (WSIS) in Geneva in December 2003, the world community strongly affirmed the central role of science in developing an information society and affirmed the principle of "universal access with equal opportunities for all scientific knowledge and the creation and dissemination of scientific and technical information." The WSIS Declaration of Principles recognized the essential role of the public domain and public institutions such as libraries, archives, and museums in supporting the growth of the Information Society and providing free and equitable access to information.* The WSIS Plan of Action suggested numerous approaches to implement these principles, including "e-science" as a key application of information and communication technologies in support of sustainable development.†

The international scientific community succeeded in raising these issues at WSIS and securing widespread support from participating governments. Now, with the second phase of WSIS taking place in Tunis in November 2005, the scientific community needs to take the lead in demonstrating how science—and universal access to scientific data, information, and knowledge—can make a critical difference in sustainable development and overcoming the "digital divide."

The deadly South Asian tsunami in December 2004 and what many have called the "silent tsunamis" of millions of unnecessary deaths and untold suffering from malnutrition, disease, and poverty remind us that science has far to go. Scientists must work not only to predict future hazards and develop new medicines and vaccines, but also to make scientific data and information much more accessible and useful for real-world decision-making. These disasters underscore the need to better understand how societies can best organize themselves to address pressing problems posed by limited resources, conflict, poor infrastructure, and inadequate skills and knowledge. Scientists, the original developers of information and communication technologies, often take for granted their ready access to data and information, software and hardware, and networks of colleagues. But for billions of people, even the most rudimentary access to life-saving scientific expertise and knowledge, such as an early warning or a new cropping method, is a major challenge.

How can the international scientific community help reduce the digital divide? Already, many scientists and scientific institutions are working to improve the reach and effectiveness of science through information and communication technologies. The International Council for Science (ICSU) and its Committee on Data for Science and Technology (CODATA) are collaborating with WSIS to collect and document such efforts (www.wsis-online.net/science/home_EN/). But more needs to be done.

Scientists can support distance education and training; improve the accessibility of information and communication technologies to disadvantaged, marginalized, and vulnerable groups; communicate technical knowledge to the general public; and establish digital libraries, data archives, and other mechanisms to increase access to scientific information. We urge the scientific community to come up with more creative ideas and outcomes. Noteworthy examples on this front include the efforts by the Massachusetts Institute of Technology to provide electronic access to its course materials (http://ocw.mit.edu/index.html) and by the Global Biodiversity Information Facility to make primary scientific biodiversity data openly available (www.gbif.org). The scientific community should also consider new approaches to open electronic access, such as the Science Commons (http://sciencecommons.org), that, among other things, address the complex issue of licensing structures.

Immediately after the South Asian tsunami, critical data on elevation, population location, administrative boundaries, and damage could not be shared because of intellectual property and national security constraints. Even now, the 30-meter-resolution data from the Shuttle Radar Topographic Mission (SRTM) flown by NASA in the year 2000 is not publicly available, although it could potentially provide the best available elevation information regarding most of the world's coasts. The pending decision by the U.S. National Geospatial-Intelligence Agency to prohibit public access to various aeronautical products would be another step in the wrong direction. The scientific community needs to press governments not only to release specific data sets that are vital to disaster management and planning, but also to establish a "good Samaritan" principle for the use of data and information in humanitarian emergencies.
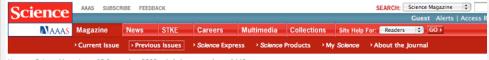
Science helped to create the Information Society—it can now help extend that society to all.

Shuichi Iwata and Robert S. Chen

Shuichi Iwata (University of Tokyo) is president of ICSU's CODATA. Robert S. Chen (Columbia University) is secretary-general of CODATA. CODATA is based in Paris, France.

*WSIS, Declaration of Principles (document WSIS-03/GENEVA/DOC/4-E, 12 December 2003). †WSIS, Plan of Action (document WSIS-03/GENEVA/DOC/5-E, 12 December 2003).

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Science 12 September 2003:
Vol. 301. no. 5639, p. 1443
DOI: 10.1126/science.301.5639.1443

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EDITORIAL

Science and the Information Society

Jane Lubchenco and Shuichi Iwata

In the opening line of his Editorial "A Challenge to the World's Scientists" (*Science*, 7 March 2003, p. 1485), United Nations (UN) Secretary-General Kofi Annan states that "Science has contributed immensely to human progress and to the development of modern society." He acknowledges that "Recent advances in information technology, genetics, and biotechnology hold extraordinary prospects for individual well-being and that of humankind as a whole." But the real challenge he puts to the scientific community is this: "[Y]our advocacy can help bring about a breakthrough in access to scientific knowledge . . ."

As scientists, most of us probably take such views on the value of science for granted, but this is not necessarily the case for our political leaders, nor for society as a whole. Thus, Kofi Annan's challenge is one to which the international science community needs to respond forcefully. The World Summit on the Information Society (WSIS), which will take place in Geneva, Switzerland (December 2003), and Tunis, Tunisia (2005), provides an unprecedented opportunity for the scientific community to promote the importance of open access to scientific knowledge to world leaders and thereby demonstrate that we are indeed "an indispensable partner of the United Nations."

The International Council for Science (ICSU) and its Committee on Data for Science and Technology (CODATA) are working with other international science organizations to ensure that the crucial role of science in the development and use of information and communication technologies (ICTs) is clearly recognized in the formal declarations that come out of the WSIS. Scientific knowledge carries enormous potential for helping the world address the UN Millennium Development Goals, and the use of ICTs opens up unprecedented opportunities to accelerate this process. At the same time, scientists and governments must work together to eliminate, not widen, the "digital divide": the division between rich and poor, North and South.

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The Eighth Plenary Session of theWorld Summit on the Information Society, 18 November 2005 , Tunis

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