Digital Library for Creative and Sustainable Society

Makoto Nagao
Prof. Em. Kyoto University
Past President, National Diet Library
April 22 2013
ITU Meeting, Kyoto
Construction of Creative and Sustainable Society
Mission Statement of Kyoto University

• Pursue harmonic coexistence within human and ecological community on this planet.

• The concept includes not only human society but also plant and animal worlds, mineral and energy resources, water, air, ocean and atmosphere etc., that is, the Earth in total.

• The Earth in this sense should sustain the harmony with recycling-oriented/circulatory movement.
Requirements Defined for Sustainability by Japan for Sustainability (JFS)

(1) Resources and their capacities
    the minimum consumption

(2) Impartiality in time scale
    inheritance of legacy to the next generation without prejudice
(3) Impartiality in space scale
    impartial apportion of wealth among regions and social stratum, and no exploitation in it

(4) Diversity
    respect of diversity in individuals, species and culture

(5) Connection
    the will to communicate with others in open mind for a better world
Inheritance of Knowledge

• Digital library will be essential for the inheritance/sustainability of human knowledge

• Knowledge is composed of a large network of relations among different items of multi-media information

• This knowledge structure is an approximation of knowledge in human brain

• This can only be realized by digital library, and will contribute greatly for creative activity
II Digital Library of National Diet Library (NDL) of Japan (Diet = Parliament)
### Current situation of digitization of NDL’s collection (as of August 2011)

<table>
<thead>
<tr>
<th>Type of materials</th>
<th>Number of collection (as of the end of the FY2010) (A)</th>
<th>Digitized materials (^1) (B)</th>
<th>Undigitized materials (A-B)</th>
<th>Operation rate (B/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare Books and Old Materials</td>
<td>290,000</td>
<td>70,000</td>
<td>220,000</td>
<td>1/4</td>
</tr>
<tr>
<td>Japanese Books</td>
<td>4,270,000</td>
<td>880,000</td>
<td>3,390,000</td>
<td>1/5</td>
</tr>
<tr>
<td>Japanese Periodicals</td>
<td>4,550,000</td>
<td>1,010,000</td>
<td>3,540,000</td>
<td>1/5</td>
</tr>
<tr>
<td>Doctoral Dissertations</td>
<td>390,000(^2)</td>
<td>140,000</td>
<td>250,000</td>
<td>1/3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,500,000</strong></td>
<td><strong>2,100,000</strong></td>
<td><strong>7,400,000</strong></td>
<td><strong>1/5</strong></td>
</tr>
</tbody>
</table>

\(^1\): Publication dates of digitized materials are as follows:
- Rare books and Old Materials: Before 1603 (Edo era)
- Japanese Books: Published in 1868 (Meiji era)-1968
- Japanese Periodicals: Published in 1868 (Meiji era)-2000 (excluding titles with commercially published materials)
- Doctoral Dissertations: Accepted FY1991-FY2000

\(^2\): Total number of collection as of FY2009, minus the number of materials cataloged between FY2001 and FY2009 (which are to be digitized by each university)
NDL’s Efforts for Varieties of Knowledge

- Legal deposit of digital publications
- Archiving of sound disks, science films, radio and TV broad castings all in digital forms
- Archives of the records of all kinds of the Big East Japan Earthquake
- Access to Korean and Chinese National Libraries through machine translation
Big East Japan Earthquake Archive Project [http://kn.ndl.go.jp/](http://kn.ndl.go.jp/)

- Big Earthquake Archive Project which gathers and archives every record of damages and recovery processes of 3.11, 2011 disaster in Tohoku Area, Japan, will contribute to the planning for the future similar disasters in the world.

- The archive includes not only documents and data but also sound recordings of sufferers, video recordings of the disaster areas and tsunami waves etc.
Archives of the Big East Japan Earthquake

Cooperation with the relevant ministries

Preserving online earthquake disaster information
- Use of information and communication technology in building archives
- Support for preservation of earthquake disaster information in local governments

Research information, data, etc. related to earthquake and disasters
- Cooperation with Tohoku University, etc.

Digitization of the following:
- Records on reconstruction of industries, factories, stores, etc.
- Regional information on books, climates, etc.

Research and records regarding current state and change of natural environment

Various records and information regarding nuclear power plants accident and earthquake disaster

Institutions holding records

Records and information held by each organization

Ensuring unified access and everlasting conservation

Assumed assignment for each ministry
(based on the handouts of a workshop of the Reconstruction Design Council in Response to the Great East Japan Earthquake on June 4)
III Problems of Standardization in Digital Library Construction
Metadata Standards for Digital Library

• Traditional catalogue, MARC, is insufficient for resource description and discovery
• Dublin Core was proposed in 1998, which had at least fifteen description slots to cope with Web and other information.
• Dublin Core was approved as an international standard, ISO15836 and NISO Z39.85 in 2003
• Another activity was initiated by the Library of Congress (US), whose major purpose was to link relevant materials in a library.
• This is called RDA (Resource Description and Access) and was started April, 2013.
• Annotation of a large volume of resources by these metadata schemes will be quite expensive because the annotation should be done manually by skilled persons.
NDL’s Efforts for Big East Japan Earthquake Archives

• Metadata scheme was fixed for varieties of data obtained from the Big Earthquake
• It is based on Dublin Core with some modifications
• For example, a picture is annotated by the information such as photographer, place, day and time etc.
Problems in Annotation for Still and Motion Pictures

• Extraction of features by image analysis technology is advanced, and the features can be used as keys for retrieval

• However these features have a limitation in the accuracy, and also for the retrieval purposes

• Therefore, annotation must be given manually in words, phrases, and sentential descriptions
IV  Digital Publishing Contributes to Sustainability of Environmental Condition
Reduction of Environmental Aggravation by Digital Publishing

• Reduction of paper consumption by digital publishing, particularly by digital newspaper publishing, will result in the protection of forest destruction

• Distribution of published materials, particularly of newspapers, which is done by trucks at present will disappear, and the reduction of petroleum consumption and Co2 exhaust will be achieved
Digital Library as a Base for the Cultural Inheritance and for the Enhancement of Creative Activities
Inheritance of Culture

• Inheritance of culture is a big issue for the healthy sustainable development of every regional society

• Digital library network of every regional society on the Earth will contribute very much for the mutual understanding among different regional societies
World Digital Library

• World digital library was initiated by UNESCO and the Library of Congress, and more than 40 libraries in the world have joined the project.

• The purpose of the project is to accumulate representative cultural assets of countries and regions, and open them to the world-wide utilization, particularly for the education of young people to understand culture in foreign countries.
Title: One Million Small Wooden Pagodas and Dharani Prayers

Description

*Hyakumanto Darani* (The one million pagodas and Dharani prayers) is the only known publication in the world whose production date is clearly identified. In 766, Emperor Shōtoku (718-770) ordered the donation of *Hyakumanto Darani*, each copy on a scroll printed with four Buddhist Dharani sutras, to ten major temples. The World Digital Library holds several of the scrolls that were donated to the Hōryūji Temple, in Nara Prefecture in western Japan. These three-tiered pagodas were painted wood, but it is unclear whether the printing blocks were of wood or metal.

Date Created

770

Language

Chinese

Title in Original Language

*Hyakumanto Darani*

Place

East Asia > Japan

Time

500 AD - 1499 AD

Topic

Religion > Other religions > Religions of Indic origin

Additional Subjects

Prayers and devotions

Type of Item

Manuscripts

Physical Description

3 pages; 5.7 × 45.5 centimeters; 5.5 × 39.7 centimeters; 5.5 × 55 centimeters
Contribution of Digital Library to Creative Activities

• Creativity will be enhanced much by analyzing the archive information and knowledge in digital library

• Cross-cultural communication can be realized by digital library network, and will contribute to create new cultural formation in the world

• Digital library can offer a kind of cloud service to publishers and other knowledge businesses by accepting their productions
Relation between Libraries, Publishers and Readers in Digital Age

Publisher
- Paper publications
- Digital publications

Sponsors
- Buy digital publications (contents will be preserved in user’s terminal)
- Advertising charge

Library Agency
- Digital archive
  - charge for download
  - money pay-back to publishers

National Diet Library (NDL)
- Legal deposit
- (purchase)
- digitization
  - stacks
- Free use

Public libraries
- Viewing and partial copying only in public libraries

Remote users
- Download (borrowing) by paying money (contents will be erased in a fixed time)

Readers
Introduction of e-Books to Education

- Japanese Ministry of Education is going to introduce e-books to elementary and secondary educations
- Pupils will have terminals for study which have functions of reading, writing, hearing and speaking
- E-books will be composed of multimedia materials
Importance of Broad-Band Network Technology

- Transmission of multimedia information and hyper-linked materials, particularly video programs, to pupils’ terminals in education and smartphones of millions of people needs high speed channels and complicated software technologies
- Communication among these terminals will demand more and more high-speed channels
Sustainability in many senses owes much for digital library and broad band technology