International Forum
"Knowledge Infrastructure as a Cradle of Regional Revitalization"

Forum Information
(1) Date: 10th February 2016
(2) Place: Dotemachi Community Park, Suehiro City
(3) Lecturers/Panelists: Geoffrey C. Bowker (Department of Informatics, University of California, Irvine)/ Noboru Koshizuka (Interfaculty Initiative in Information Studies, University of Tokyo)/ Shigeki Ueno (IT Promotion Group, Division of Information System, Department of Policy, Aomori Prefectural Government)
(4) Co-host: Grants in Aid for Scientific Research (A) (International Christian University) "Forecasting and Society: Social and Political Dimensions of the Science of Forecasting"

"Open data and regional development"
Summary of Lecture by Professor Geoffrey C. Bowker

Open data carries a lot to offer for the development of knowledge infrastructure. The three factors that play important roles in its development are: data literacy, understanding the users and middle-out design.

(1) Knowledge Infrastructure and the Virtues of Open Data

Infrastructure is not a purely technical architect. It is a collective of technology, but also of organizations that work together for shared aims. Therefore we need to conceptualize knowledge infrastructure as a complex, which is composed of people, knowledge and technology.

Open data improves government by increasing transparency, and enhancing public services and resource allocation. Also, it empowers citizens to take control of their lives and demand change; this dimension of impact is primarily mediated by more informed decision making and new forms of social mobilization, both in turn facilitated by new ways of communication and accessing information. Moreover, open data created new opportunities for citizens and organizations, by fostering innovation and promoting economic growth and job creation.

(2) Data Literacy

Just providing data access is not enough, and data must be understood within a

context. Therefore we need not only to make data accessible, but also to teach data literacy. For example, Climate model data cannot be interpreted without the use of complex equations and suites of proprietary software. Publishing the data sets is not fundamentally opening the data because it lacks the tools, knowledge, and systems necessary for its interpretation. Data is an ecology and can't effectively be interpreted without substantive metadata and access to the tools assumed by the creators of that data set. GIS data is useless without a map and access to the conventions of the coordinate system used.

When considering the issue of digital divide, we also need to discuss the issue of digital literacy divide. The example of OLPC (one laptop per child) project clearly illustrates this point. The project concentrated on putting computers into the hands of children in developing countries. However, the data that the children could access (including educational material) was still very American and incomprehensible to them.

(3) Understanding the Users

Citizen Science is an important new development for allowing citizens to use scientific data made available by governmental bodies. A good example is the "Air Quality Egg". Air quality monitoring stations used by authorities and scientists are often relatively far apart, providing only regional averages. However, air pollution can vary considerably on a local scale. Air Quality Egg sets out to involve the public in the debate on air pollution standards and policies by enabling them to monitor air quality in their immediate vicinity – at home or their place of work. Members of the public are invited to purchase a small, easy-to-use air quality monitor. The sensor itself is placed outside and transmits data to the 'air quality egg' which is set up inside, and connected to the internet. The data are uploaded to the internet, and the egg also has an interactive function that allows the owner to check air pollution levels instantly. Air Quality Egg is a community-led, crowd-funded project born out of the 'Internet of Things' meetings, which bring together people interested in computer networking applications. Initial funding was raised online via a crowd funding website and product development is carried out partly via an open online discussion group.

(4) Middle Out Design

Historically there have been three ways of building infrastructures: top-down, middle-out, and bottom-up. The most important approach in utilizing open-data is the middle-out design, a new mode that has developed over the past ten years. The core concept with respect to open data infrastructures is to engage end users (the citizens)

together with government agencies in the development of data infrastructures. In this way, there can be a 'fitting' process between what the agencies provide and what the users can do with the data provided.

In middle-out design, BD Hubs and BD Spokes play important roles. NSF's Directorate for Computer and Information Science and Engineering (CISE) initiated the National Network of Big Data Regional Innovation Hubs (BD Hubs) program to foster multi-sector collaborations among academia, industry, and government. *Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications (BD Spokes)* solicitation extends the BD Hubs network by establishing multi-institutional and multi-sector collaborations (i.e., across academia, industry, government, non-profits, etc.) focused on topics of specific interest to a given region, which build upon the capabilities and strengths of said region. Working in concert with the corresponding regional BD Hub, a BD Spoke would work on a particular topic that requires Big Data approaches and solutions. Each BD Spoke would function similarly to a BD Hub, but with a narrower and goal-driven scope. The set of activities managed by a BD Spoke include, for example, gathering important stakeholders via forums, meetings, workshops, etc.; engaging with end users and solution providers via competitions, community challenges, etc.; and forming multi-disciplinary teams to tackle questions no single field can solve alone.

Reference

Bowker, Geoffrey C., 2016, "Open Data and Regional Development" International Forum: Knowledge Infrastructure as a Cradle of Regional Revitalization.