Towards the Digital Earth with Geoinformatics

Hiromichi Fukui[1]

[1] Policy Management, Keio UniV.
GSEC, Keio Univ.

http://www.digitalasia.sfc.keio.ac.jp

In order to deal with environmental issues from global scale to regional and local levels, a correct grasp of the history and the current status of the earth are essential, and we must share a common recognition of the issues. The first step to build a sustainable society is to monitor, identify, store the data of phenomena on the earth, then process and interpret the raw data, turn them into understandable information to display, publish and distribute. Therefore we need the Digital Earth (DE) that is a virtual representation of our planet on the internet that enables a person to explore and interact with the vast amounts of natural and cultural information gathered about the earth. Much of this information refers to some specific location on the earth, therefore it is referred to as geospatial information which is mainly provide by RS and GIS.

Attempts of Geoinformatics Labo. in Keio University to facilitate geospatial information flows are inspired by an emerging body of knowledge, spatial information. It is a new field of science that studies how to reconstruct geospatial phenomena in Cyber Space and how to apply informatics outcomes in Cyber Space to the geo-spatial real world. The notion of spatial informatics is being actualized as the Digital Earth Project. The goal of this project is to construct a gate for the collaboration platform consisting of operational data infrastructure and application infrastructure. The data infrastructure probes into the geospatial world and the application infrastructure abstracts and organize collected data to reconstruct geospatial phenomena of interest in Cyber Space. The gate consisting of the two infrastructures is designed to accommodate the following two phases of information flows. One of those is the phase in which geo-spatial phenomena are transformed into information, and the other is the phase in which informatics structures in Cyber Space are fed back to the geo-spatial real world as actions and consensus. Around the conceptual backbone explained above, Geoinformatics Labo. is handling a number of technical topics as follows;

Interoperable GIS, Geospatial Mediator and MultiDimensional Visualizing such as hierarchical level of detail (LOD), etc.,

Test-bed study projects of the Digital Earth based on OGIS (Open Geospatial data Interoperability Specification),

Application of Digital Earth ranging from, participatory environmental risk monitoring and evaluations, science communication to modeling and simulation of environmental change,

Digital Asia initiative to provide people with easy access to Multidimensional Geospatial information and application over the Internet by establishing a scheme to integrate and share the GIS and RS data among all the countries of Asia.

Lessons learnt from these concrete topics and research projects give flesh and blood to the core Digital Earth Project, and such specific issues are located in wider and more global contexts in return.