Development and Utilization of Urban Resilience Geoportal Online

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In the Subproject to develop resilient society improving disaster management competence of MEXT Special Project for Reducing Vulnerability for Urban Mega Earthquake Disasters, we are developing web-based disaster-related geospatial contents sharing system called "Urban Resilience Geoportal Online" to integrate the achievement of multidisciplinary researches on the processes and impacts of mega-disaster.

The mega-disasters predicted in Japan, such as Tokyo Metropolitan Earthquake or NankaiTrough Earthquake Tsunami, bring huge amount of damage and loss in various sectors and various regions, and the scenarios of damage occurrence and loss propagation are very complex. Hence, in order to quantify each problem's importance to create disaster reduction strategies, it is very important to share and integrate data and findings across many disciplines and regions. In order to share various contents and utilizing them in various organization, we considered DIKW(Data, Information, Knowledge and Wisdom) model which is chain of thinking used in knowledge management.

Firstly, we developed community based GIS(Geographic Information System) data sharing portal site utilizing ESRI ArcGIS Online for Organization in order to share contents at data level. Researchers as community members who participate in this subproject upload their data to this portal site in the form of web map service layer which is easily mashed up with other researcher's layer on ArcGIS Online. These uploaded layers are registered in catalog system and users can search, view, mash up them on demand in catalog system or in web map viewer easily. More than 500 layers including base data, hazard data, vulnerability data and the damage and response data of past disasters are gathered in the geoportal.

Secondly, in order to share contents at information level, we developed the method to share researchers' data analysis model or impact estimation model. In earthquake disasters, many kind of damage and impacts occur in complex processes and many kind of person or organizations should prepare based on the estimation which is consisted of many data and models. The new method to share various models to analyze or estimate situation uses web GIS services. Data required in models are provided by data services. Geoprocessing service processes geospatial calculation based on a model using data from data service and create result as result service.
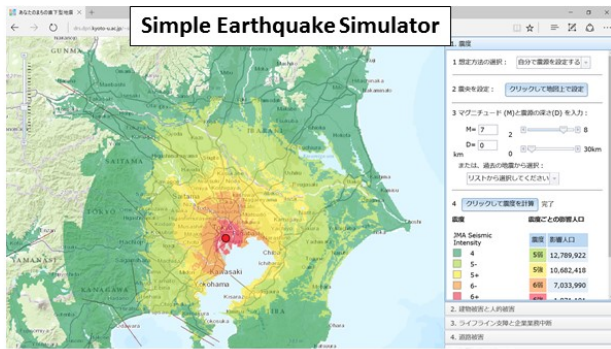
In order to give people or organization personalized estimation information, we made the simple earthquake disaster estimation application that everyone can estimate that with web browser combining these shared data and geoprocessing services. From the development procedures, making and sharing components as services enables estimation of complex disaster process because they can be combined flexibly according to needs, and this can promote collaboration of multidisciplinary researchers faster.

Thirdly, in order to share contents at knowledge level, we utilized Story Maps. Map or layer can't by itself transfer knowledge. People often can't understand what they should read from a map. People often misunderstand what the creator of the map intended to explain, or should know the story lying behind the map. So we combined story and map with ESRI Story Maps web application template. Story Map can display a series of maps according to a story along with the text which explain what displayed map is, what the map aims and what users should read from the map. Several research achievements suitable for geographic expression were shared their findings as knowledge with Story Maps. We think this method can contribute to the risk communication between specialists
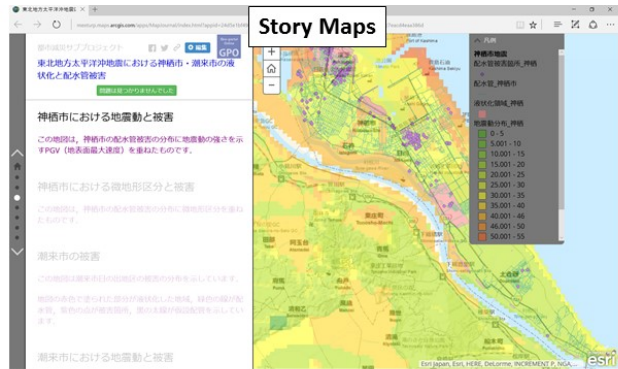
and non-specialists.
Lastly, in order to share contents at wisdom level, we are now developing response management simulator in which coordinators of disaster response in organizations can train their skills of decision making under various situations.

Keywords: WebGIS, Simulator, Story Maps