

Utilization of Digital Infrastructure Concerning Disaster Countermeasures in Japan

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According to the White Paper on Disaster Management 2018, among disaster countermeasures such as “self-help”, “mutual help” and “public help”, the most fundamental method is “self-help” which is a countermeasure individually conducted. It is important for each individual to have a high disaster prevention awareness in everyday life in order to minimize the damage through countermeasures, as rescue teams are not able to immediately reach all disaster victims during a disaster. Therefore, it is important to enhance the government's “ability to inform” and the public's “ability to become aware” by widely and appropriately providing disaster information, accurately grasping hazardous areas as well as evacuation centers in case of a disaster before it occurs, and accumulating disaster information with location information. In order for this to lead to “mutual help” and “public help”, sufficient accumulation and sharing of disaster information within the local community including residents, corporations and the local government are essential during normal times.

On the other hand, in recent years in Japan, a cloud computing society where the internet can be reached from various information tools has been established, and Japan has entered the age of Internet of Things (IoT) and Internet of Everything (IoE) in which various things can be connected to the internet. The society mentioned above is able to efficiently gather and accumulate disaster information as local knowledge made up of knowledge from the experience and everyday life of residents as well as the expertise based on scientific findings through the effective use of Information and Communication Technology (ICT). The present study focused on social media and GIS of ICT as a digital infrastructure, which play important roles in disaster countermeasures. The present study also introduced development cases of the system developed integrating these, and presented the utilization potential as a digital infrastructure.

Additionally, Twitter, which is the most-used social media platform for disaster countermeasures in Japan, was focused on, and its utilization cases during the Heavy Rain Disaster in Western Japan in 2018 were considered as well as the utilization potential of Twitter as a familiar digital infrastructure in disaster countermeasures was indicated.

As the reality and virtual spaces are closely related and integrated in super-smart societies such as Japan, everyday events in either space influences the other space. Therefore, if a disaster in reality occurs, the transmission and reception of disaster-related information in the virtual space using various information communication methods such as mass media and social media start almost simultaneously. While this can lead to real activities such as evacuation, relief and support, it can also cause problems such as confusion due to information overload. Therefore, the issue is how to make the information circulating in the virtual space and especially on social media efficiently and effectively aid in the rescue and support activities in the reality space.

In order to solve such an issue, it is necessary to not only set rules for the utilization of social media but also to sift through information and share only the necessary information to the affected local governments and those involved in the rescue and support activities. In doing this, if the social media GIS for disaster information system and the function of social media mapping of the spatiotemporal information system are utilized, the essential information can be efficiently consolidated on the digital map of Web-GIS. Additionally, while the present study indicated the utilization potential of Twitter alone during disasters, the same utilization potential of other social media platforms based on their characteristics should be considered.

Furthermore, various information communication methods including verbal calls in addition to ICT are necessary in order to prevent people who are vulnerable to disasters from becoming people who are also vulnerable to information. Though prompt evacuation may not be realized, due to the normalcy bias where an individual has the “I’m okay” mentality during disasters, finding a way to effectively use ICT to encourage individuals to evacuate is an issue. It is necessary for individuals who are not used to using ICT to familiarize themselves with utilizing it in their daily life.

Keywords: Information and Communication Technology (ICT), Digital Infrastructure, Geographic Information Systems (GIS), Social Media, Disaster Countermeasures