

Japan's DX Initiatives in Resilience

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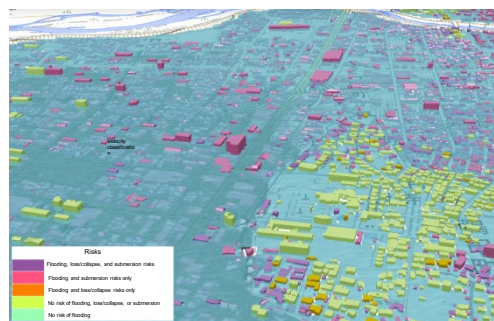
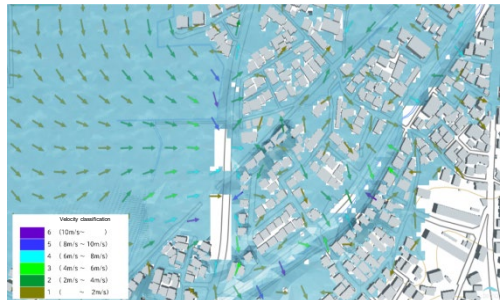
26 October, 2023

Tsukuba, Ibaraki Prefecture, Japan

- Intangible measures for natural disasters are made for all phases, including normal times (evacuation plans, evacuation drills, etc.), pre-disaster (disaster prediction and status, communication of evacuation information), and post-disaster (evacuation shelter management, relief supply distribution, disaster certificates issuance, etc.).
- Use of DX can solve problems at various phases.

Normal times

Evacuation plans and drills

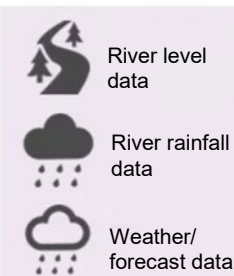


3D models allow simulation of water flow around buildings and the flooding/collapsing risk of each building.

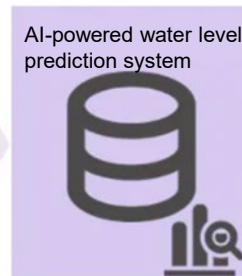
Pre-disaster

Disaster prediction/status
Communication of
evacuation information

Past/real-time data
entry



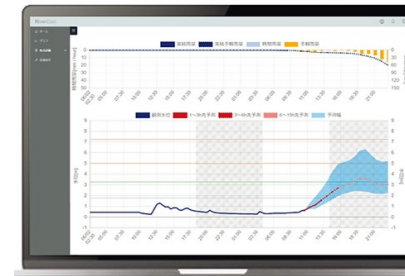
Water level prediction
at each measuring
point based on data



Early grasp of the
situation / Evacuation
preparations



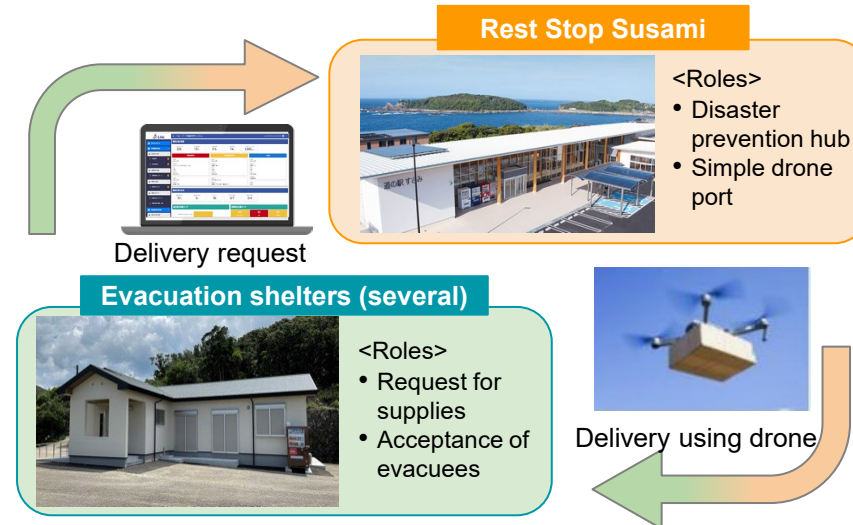
River water level gauge



AI-powered water level
prediction system

Post-disaster

Relief supply distribution
Evacuation shelter management



Takanawa Gateway [Evacuation simulation using three-dimensional (3D) technology]

- In the event of a disaster, both the residents and visitors would congregate in the areas around stations in city centers. To ensure the safety of the entire areas, measures have been taken through public-private partnerships
- ⇒ In Takanawa Gateway area, a digital twin of the area represents the entire area through a three-dimensional (3D) city model. By developing a large-scale evacuation simulation environment and analyzing evacuation behaviors, potential risks of evacuation routes were **clearly visualized in 3D. It will be used for evacuation planning to update disaster preparedness plans even before buildings under construction are completed.**



3D model of the area
(PLATEAU)



Evacuation simulation with a 3D model for inside and outside of the building



Used for evacuation planning and consensus building

Tsu City, Mie Pref., etc. [Efficient Disaster Information Transmission with One-coin Inundation Sensors]

- Several cities have installed small, durable, inexpensive inundation (flood) sensors in large numbers on levees and within watersheds.
- ⇒ Enables the rapid identification and collection of information on levee overtopping and breaches, as well as flooding conditions in the area. Contributes to early response to disasters (e.g., closure of roads due to flooding, establishment of evacuation centers, consideration of pump truck deployment, etc.) and faster disaster recovery.



When a sensor detects a flood, information from the sensor and the estimated flood area are shown on the display system in real-time.



Susamicho, Wakayama Pref.

[Delivery of relief supplies by automated drones]

- In the event of a disaster, such as a predicted Nankai Trough earthquake, the national highway along the coast would be cut off by tsunamis, isolating some villages in the community.
- ⇒ The town has started field testing a system designed to deliver supplies to isolated evacuation shelters and other locations using multiple automated drones. The system is planned for development and implementation in two years.



- ◆ DX can solve problems in all phases: normal times, pre-disaster, and post-disaster.
- ◆ It is important to further develop digitalization that can specifically meet the local issues and each resident's situation. That should be able to offer fine-tuning disaster prevention measures and information, as well as evacuation support, tailored to the local disaster risks.
- ◆ Sharing knowledge and technology to solve individual and specific challenges enables the joint development of innovative services.
- ◆ We would like to propose that a collection of best practices, including presentations at this meeting, be prepared for sharing.

Thank you for your attention.

