Distributed Data-Sharing for Fast Response and Decision Support

Tho Nguyen, Andrew Grimshaw, Ron Hutchins – University of Virginia
ASEAN EAGER, FY2020

Effective data and information sharing can enable collaboration and coordination between different city stakeholders. However, current approaches to data sharing are challenged by data quality, control, and provenance issues. A peer-to-peer infrastructure allowing stakeholders to share access to data in-situ can overcome many of these challenges.

Community-identified problem: Ho Chi Minh City, Vietnam, suffers from lack of urban planning and streamlined government services, which results in extreme stress during disruptive events such as flooding – traffic jam, utility failure, pollution.

Technical merit: This project explores approaches to ensure data network reliability and security in the context of unreliable infrastructure and weak level of assurances. Social merit: Data from this project contributes to the understanding of uptake and scaling of new technologies. The project application pertains to urban planning and disaster response.

To date, we have deployed and trained our community partner on the *Globally federated file system* software stack, which underpins the distributed data network. We've also developed a taxonomy of the local networking architecture, and designed a hybrid infrastructure for data sharing.
We've identified key stakeholders and data sources participating in the data ecosystem. Our goal is to demonstrate utility of this approach to city managers in summer2021.

Based on community input, we are also developing a simplified Flood Watch mobile application for residents. The app allows residents to get up-to-date information on effected areas due to flooding, which allows them to plan accordingly.

This project provides: (1) an immediate infrastructure for city managers to collect data and engage expert recommendations on course of actions. (2) deploy a mobile application that informs residents of up-to-date information on disruptive events.

Sustainability: Both the data infrastructure and mobile application can be extended to other emergency response scenarios (beyond urban flooding). Examples include public health crisis response, mass casualty events, or natural disasters.

In the coming year, we are planning to (1) convene a demonstration workshop to showcase the utility of the data infrastructure to HCMC city managers. And (2) roll out the Flood Watch mobile application for HCMC residents