

Flood Control in Indonesia

Flood Control System
in Jakarta

Flood Control System of the DKI in Jakarta (WSIS)

The Jakarta Flood Control System has received its first awards. The development was chosen as the winner of the ITU WSIS Prizes 2022 in the e-Science category as well as the IDC Smart City Asia Pacific Awards 2022 in the Public Safety category.

Background

Years of flooding have affected Jakarta, but up to this point, the flood management system has relied on manual observations from people to monitor river flow and level. As a result, there is little monitoring and cooperation takes a long time. With the speed at which technology is developing, it is now possible to monitor and manage Jakarta's floods. With the power of the Internet of Things (IoT) and Artificial Intelligence (AI), this most recent flood control method is available. To improve Jakarta's flood risk management, Jakarta Smart City and the Jakarta Water Resource Service (DSDA) collaborated and developed this flash flood control system.

Introduction

The Flood Control System was developed as a consequence of the DKI Jakarta government's challenges in disseminating flood point information and in coordinating with authorities and stakeholders. This flood control system is a system designed to predict potential floods and improve response when floods do occur. The purpose of this system is to raise public awareness, quicken government action, prepare for flood emergencies, and enable real-time flood monitoring by all interested parties.

Flood Control System

The Flood Control System functions by compiling past data from CCTV and sensors (water level, vibration, and temperature). The sensors and Internet of Things (IoT) that are used to gather the data are installed in 178 places (pump houses and sluice gates in Jakarta), and they include water surface height sensors, water current sensors, rainfall sensors, pump vibration sensors, and pump temperature measuring sensors. The Flood Control System will then undertake analysis to create information on circumstances, potentials, and predictions so that it can suggest solutions for addressing floods in Jakarta. The data is then merged into one platform.

The government will be able to apply this information to make decisions on how to handle Jakarta's floods. Flood protection and control initiatives will be more successful and targeted with data-based approaches. The Flood Control System is also anticipated to give the most recent flood monitoring, hasten government action, and raise public awareness.

In the development of a Predictive and Intelligent Flood Control System in Jakarta, this system contains three components, namely:

– Sensing (detecting): gathering and integrating data from a variety of field-installed sensors



Fig1. Vibration and Temperature Sensor



Fig2. Water Level Sensor (Jakarta Smartcity)



Fig3. Water Flow Sensor (Jakarta Smartcity)



Fig4. Rain Fall Sensor (Jakarta Smartcity)

– Understanding: using artificial intelligence and machine learning to transform data into information; and



Fig.5 Box Panel (Jakarta Smartcity)

When it comes to storing and sending analog data from sensors, there are two processing tools that are essential. I/O logic, which will first handle analog data from sensors then calculations and information about each recording sensor's status make up this data. The output of this recording is raw data, which will be transferred via a data logger connected to the internet and shown on the dashboard of the Flood Control System.

– Acting: provides data in a centralized dashboard for the DKI Provincial Government's flood control ranks to use in decision-making and as a proactive alert to the community.



Fig.6 Monitoring Flood Risk in Real-time (Jakarta Smartcity)

Water level, rainfall, and other variables that can be tracked in real-time can be used to calculate the risk of flooding in Jakarta, which will simplify and accelerate the coordination process for managing floods.

Conclusion

The installation of IoT sensors is a long-term investment that can occasionally store past flood data at many locations throughout Jakarta. Government agencies will be able to develop more specialized policies and initiatives in the future as more data is gathered. With all of these advantages, it should come as no surprise that this technology is still in development and has a lot of potential for preventing floods in the future.

References

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