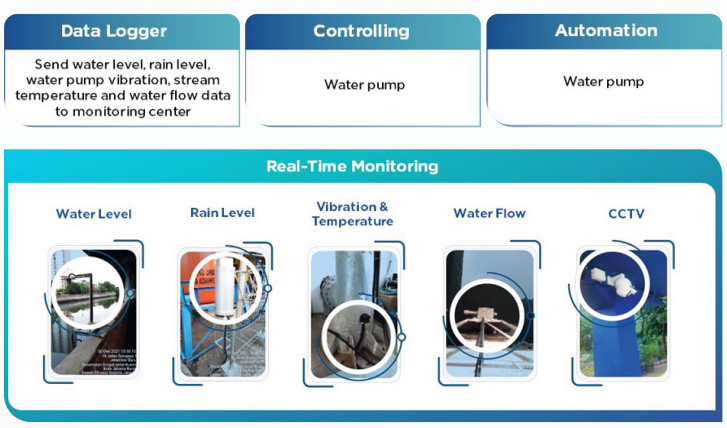
Client : Jakarta Smart City
Country : Indonesia
Sector : Government

Empowering data-driven flood management in Jakarta through an integrated, large-scale solution

Challenge:

Flooding in Jakarta is a frequent occurrence, especially during the seasonal monsoon and rainy season that lasts for at least 6 months in Indonesia. These floods cause material and non-material losses, with at least 10 trillion rupiah worth of losses reported in the industrial sector during 2020, in addition to causing disease outbreaks and exacerbating social issues.

There was a need for real-time monitoring of all parameters that can cause flooding, including river water flow, rain intensity, water level and water pump conditions at floodgates. Awareness within local communities was also needed to support the government's disaster management programmes.



Solution:

XL Axiata Business Solutions introduced a flood monitoring solution, which was part of the broader Jakarta Smart City project.

The solution consisted of several integrated sensors and devices, enabling real-time recording of data and conditions at each floodgate. At least four types of sensors were installed, including:

1. Water Level Sensors: to calculate the height of an open channel using precise digital-type radar technology
2. Water Flow Sensors: to generate information on water current strength in open channels by detecting the strength of the water's vibration and its pressure
3. Pump Vibration Sensors: to detect vibrations by telemetry and the temperature of the water pump
4. Rainfall Sensors: to calculate incoming water discharge in the cross-sectional area, before coaslescing this information to provide a detailed picture of rainfall intensity over a certain period

Radar sensors were used as an alternative to ultrasonic sensors, which are often affected in the event of air turbulence - a frequent occurrence in river ecosystems.

Information from these sensors were then sent and recorded in a data logger to be integrated, before being processed and analysed according to the specified parameters. Closed Circuit Television (CCTV) was also used to visually monitor conditions at the floodgates.

In total, 300 employees were involved in the operation of this large-scale project.

Results:

The government is now able to monitor real-time conditions at every floodgate in the Jakarta area

By combining information from the sensors and real-time CCTV visualisation that can be accessed from the Government Command Center, the solution had helped to minimise human error, which is more likely to occur when manual data collection is carried out

Through real-time analysis of the data collected, the government's decision-making process on flood mitigation has been enhanced

> "Utilising Internet of Things (IoT)-based technology and by installing sensors in pump houses, we can now automatically identify and distribute flood-related information and predict potential floods. The solution installed has become the basis for optimal flood management in Jakarta, empowering the creation of data-driven and more effective policies."

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