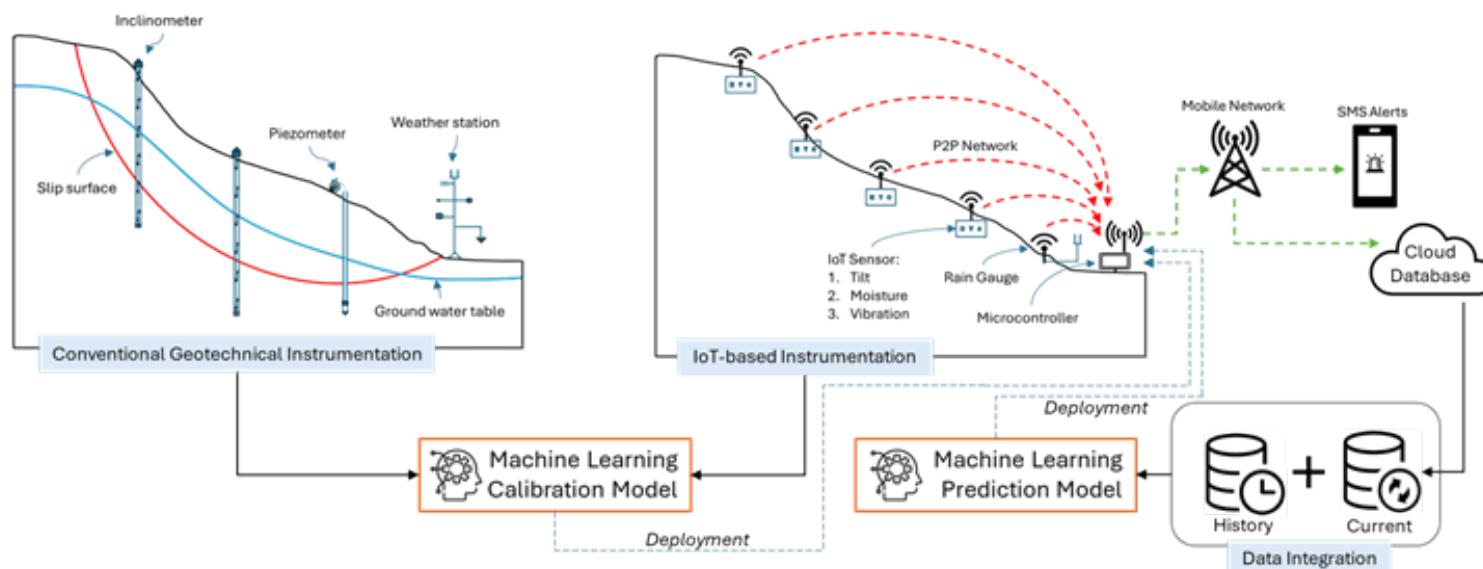


### SLOPE-AI (Smart Landslide Observation and Prediction Enhanced with AI)



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Landslides are among the most destructive natural hazards, causing loss of life, property damage, and environmental degradation, especially in tropical ASEAN regions where heavy rainfall and seismic activity are frequent triggers. Effective monitoring and early warning systems are essential for reducing risks. However, traditional geotechnical tools such as inclinometers and piezometers, although accurate, are expensive and require complex installations, making them impractical for widespread use in high-risk areas.

To address these limitations, this project proposes SLOPE AI, or Smart Landslide Observation and Prediction Enhanced with AI, an IoT-based landslide monitoring and early warning system. It incorporates low-cost IoT sensors including tilt, moisture, rainfall, and seismic vibration sensors, which will be calibrated against conventional instruments using machine learning to ensure accuracy. Sensor placement will be based on geotechnical assessments conducted in the early phase of the project. The system uses AI to analyse historical and real-time data to predict landslide events and generate timely alerts. Communication between sensors and microcontrollers will rely on a low-energy peer-to-peer network, and alerts will be transmitted in real time through mobile networks to enable rapid response.