COLLEGE CODE: 9133
COURSE: Internet of Things(IoT)
PHASE I: Problem definition and Design thinking
PROJECT TITLE: Flood monitoring and Early warning

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Problem definition:

→ Flooding is one of the major disasters occurring in various parts of the world including Malaysia.

→ To reduce the effect of the disaster, a flood warning and monitoring are needed to give an early warning to the victims at certain places prone to flood.

→ By implementing Internet of Things technology into the system, it could help the victim to get an accurate status of flood in real-time condition.

Design thinking:

System design

Hardware modules details

- Ultrasonic sensor
- Rain sensor
- Buzzer
- LED
- NodeMCU

Software required:

Blynk application

- This system is based on NodeMCU based technology integrated using the Blynk application.
- The wireless sensor node can help the victims by detecting the water levels and rain intensity while giving an early warning when a flood or heavy rain occurs.
- Basically, the sensor node consists of an ultrasonic sensor and rain sensor controlled by NodeMCU as the microcontroller of the system which is placed at the identified flood area.
- Buzzers and LEDs started to trigger and alert the victim when the flood had reached a certain level of hazard.
- Data detected from the sensors are sent to the Blynk application via wireless connection.
- Victims will get to know the current status of flood and rain by viewing the interface and receiving push notifications that are available in the Blynk application via IOS or Android smartphones.

Challenges and limitations:

Challenges:

- If we have required data, accurate prediction can be done.
- By providing accurate prediction, one can allocate resources to those in need or can predict the possibility of flood.

Disadvantages:

- Inability to produce highly accurate results.
- If there is no sufficient data, flood prediction cannot be done.

Conclusion statement:

✓This study is based on the development of a smart flood monitoring system using ultrasonic sensors with NodeMCU and Blynk application.

✓The results offer flexibility, efficiency and low cost. Wireless sensor node based on the Blynk platform is an ideal platform to monitor flash floods and also as early warnings.

✓The working of a low-cost ultrasonic sensor and rain sensor integrated with NodeMCU are able to detect and provide efficient and accurate sensing data for monitoring and alerting purposes.

✓Through the experiment conducted, it shows that this system can be used for detecting, monitoring and alerting the community in Selangor in case of flash flood