

Irrigation Water Gate Monitoring System Based on The Internet of Things Using Microcontroller

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ABSTRACT

Real-time periodic monitoring of the water level that is available in the irrigation canals, can provide positive impacts that are beneficial to farmers. The positive impacts received by farmers are the use of water becomes more efficient, reduces losses, and helps to distribute irrigation water fairly to farmers. A fair and equitable distribution of water for farmers is one of the supports to maintain farmers' rice productivity. The purpose of this research is to design a real-time monitoring system of the irrigation height conditions that can be accessed by mobile devices.

This study uses a microcontroller for designing an automatic control system. This microcontroller is integrated with an electric motor and connected to a gearbox to open the sluice. The microcontroller sends data through the ethernet shield to the router (TP-Link). This TP-link has been integrated with the GSM (Telkomsel) Model Module to facilitate data exchange. The GSM modem module sends data to the Google form database stored in the Google spreadsheet. This Google spreadsheet is a table that can be filled automatically by the control system in real-time. This Google spreadsheet is displayed on the wix website. This data can be accessed through the user's smartphone device.

From the results of research conducted for 5 days, the accuracy of the data sent by the microcontroller to the user's device reaches 99.6%. In addition, the amount of internet quota that is used to send one real-time data on the water level, door height, hour, minute, second, date, month, and year is 64.68 kB/ cycle into the Google spreadsheet. When the sluice works every ten minutes every day, the quota used every day is 9.313 Mb. If you accumulate it in 1 month, it takes 279.417 Mb or 0.27 Gb / month (1Gb / month, which is IDR 10,750). In terms of cost, this value is certainly affordable for farmer group managers to replace human labor in monitoring the height and irrigation water openings height in real-time.

Keywords: Google spreadsheets, Internet of Things, Microcontroller, Real-Time Monitoring, Automatic sluice.

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