Abstract

Having small and limited green area in urban area of developed country , its not possible do farming on open land. Nowadays technology's development more advanced, so its possible do farming in small and limited green area. Hydroponic is one of the technology solutions to farm on limited green area. Hydroponic doesn't use soil (soilless) as plant growth media but using water and husk. Hydrophonic plants need special attention from farmer in order to plants growth as expected. If shortage of plants growth element, hydroponic plant will be whitered and die slowly.

To resolve hydrophonic problem, especially water media, in this final project build a prototipe automation system hydroponic based on IoT. Prototype automation system built can do monitoring process and running the actuator when there is a change in elements of plant growth based of IoT concept. System focused on water flow, pH water, water temperature, and light intensity as parameter elements of plant growth. Data parameter elements of plant growth is acquired by the sensors that integrated with microcontroller Arduino Uno. Data is submitted serial from Arduino to Raspberry pi. Data will be sent via internet to data source on Ubidots server. Next raspberry pi will request data on Ubidots server to run actuator.

The prototype built has been successfully do automate if there is a change elements of plant growth based on parameters that have been defined before. Cooler will do cooling of water temperature in water's box when the water temperature in the box have exceeds 25ºC. Growth light LED will turn on when light intensity is less than 10000 lux. A buzzer alarm will beep when no water flow or water flow is less 18 mL/hour. And one of solenoid valves will open the valve in case of pH change for 3 second to flow pH solution. In monitoring scenario, actuator can be run properly based on rules that have been defined when there is a change elements of plant growth. There was an error reading by sensors during monitoring. So system perfomance will be hampered.

Keywords: *Hydrophonics, IoT, automated, monitoring, sensor, actuator, server.*