UNIVERSITY OF CAPE COAST

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DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

CSC 499 PROJECT WORK

IoT IRRIGATION SYSTEM

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REPORT ON FINAL YEAR PROJECT
"IoT IRRIGATION SYSTEM"
BY LARTEY JOSHUA AND SAMUEL OFORI

Agriculture is unquestionably the largest livelihood provider in Ghana. With rising population, there is a need for increased agricultural production. In order to support greater production in farms, the requirement of the amount of fresh water used in irrigation also rises. Currently, agriculture accounts for 60% of the total water consumption in Ghana. Unplanned use of water inadvertently results in wastage of water. This suggests that there is an urgent need to develop systems that prevent water wastage without imposing pressure on farmers.

Over the years, farmers started using computers and software systems to organize their financial data and keep track of their transactions with third parties and also monitor their crops more effectively. In the Internet era, where information plays a key role in people's lives, agriculture is rapidly becoming a very data intensive industry where farmers need to collect and evaluate a huge amount of information from a diverse number of devices (eg., sensors, farming machinery etc.) in order to become more efficient in production and communicating appropriate information.

Smart Agriculture uses an IoT system powered by ESP 32. It consists of a Water Proof Temperature sensor, Moisture sensor, PH sensor, flow rate senor, relay and mini water pump or solenoid valve. When the IoT based agriculture monitoring system starts, it checks soil moisture, temperature and PH value of the soil. Based on these readings, the system automatically pumps the water to moisturize the farm should the soil moisture level be low. The PH level sensor also detects how acidic or basic the soil is and then suggests if fertilizer should be applied or not. The flow rate sensor is used to calculate the amount of water that is being used as irrigation goes on in the farm. The LCD is to display the reading as well as the web interface and mobile app interface. The water pump can be started manually using the web interface or the mobile app as well as stopping it.

This idea came about when students acute to the IoTDev Lab were asked to brainstorm and put ideas together to come out with a project for the final year. Inquiries of this project was made by students in the various sectors of the farming system including the University farm and other farmers who practice Irrigation farming as their full time job.

The project started on 30th January, 2020 with chapter one and two which are the introduction and literature review respectively. Currently, chapter one and two of the project have been completed and submitted to the supervisor. Chapter three is underway. This chapter is made up of a website, a mobile app and a hardware part which will be installed on the farm. The website is 98% completed while the mobile app is about 85% completed. The hardware part of the project is made of sensors and micro controllers of which some will be bought in Ghana and the others from outside Ghana. This decision was due to the outbreak of the corona virus pandemic. Currently, one of the sensors bought from Amazon arrived in Ghana while the others which will be bought in Ghana are in progress and will be in when school or academic work resume. By this the project is 65% complete and if all things work equally, the project will be ready for submission when school officially resumes.

Though arrangements were made for the purchase of the sensors, financial challenges, cooperation of members are some of the difficulties this project is facing which has been brought to the notice of our supervisor.

This project is undertaken by Lartey Joshua of index number "PS/CSC/16/0056" and Samuel Ofori of index number "PS/CSC/16/0072" and is supervised by Mr. Isaac Armah-Mensah.

In conclusion, this project will be completed if we have access to the rest of the hardware parts when school resumes or the website and the mobile app will be completed and submitted as the final project.