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SMART FARMING IRRIGATION SYSTEMS USING INTERNET OF THINGS

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ABSTRACT

The global population growth rate is greater than the exponential increase in food production. The agricultural economic sector is challenged to cater for the increased demand for agricultural products. Agricultural irrigation plays a very important role in sustaining increased food production. Older irrigation methods used in earlier years are less efficient in managing resources. The advent of IoT technological realm brings various opportunities for redesigning almost all sectors of the economy. Irrigation systems are no exception to this technological manifestation. IoT is challenging existing irrigation methods. Agricultural irrigation can leverage IoT to monitor environmental sensors that detect soil moisture content, humidity, temperature, and irrigation infrastructure.

This study made use of Delphi survey technique to gather insights from a panel of experts in the domain of IoT and irrigation systems. The primary purpose of this study sought to determine in what ways can IoT be useful in improving the overall performance of smart irrigation systems. The study further evaluates the usefulness of IoT-based smart farming irrigation systems on reducing the overall cost of crop production.

An IoT architectural framework assists in conceptualising how various components of an IoT based smart farming irrigation system integrate. How well IoT architectural frameworks integrate with legacy irrigation systems is a key success factor to improving their overall performance. The lack of standards and well-established best practices negatively impacts on the potential use of IoT. Various architectural framework proposals were examined in this study and a consensus was reached on the best suited IoT architectural framework for smart farming irrigation systems.