ASSIGNMENT 2 RSH 381 : THE METHODS

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# Internet of Things

Research topic : IoT in Agriculture with arable farming

Problem statement : Internet of Things is not only where communication between humans and machines take place, but also where communication between machines take place . As objects in everyday life interact with one another (Kumar, et al., 2019) . Agriculture is one of the most important aspects not just in IoT , but around the world . It is the largest source of food in the world , according to the United Nations the world population will increase by 2 billion people by 2050. Which means more global demand for food and water will continue to increase (Friha, et al., 2021).The IoT based mobile application can provide real time information on soil nutrition and characteristics (Dhanaraju, et al., 2022) . IoT has various application in agriculture such as using wireless cameras and sensors to monitor the farm and gather data in the form of videos and pictures , concentrating on accurate sowing by utilizing remote-controlled tractors to minimize seed wastage , maximizing plant spacing to provide the greatest potential output per acre , etc (Sinha & Dhanalakshmi , 2022) .

The main problem with arable farming is the IoT devices find it difficult to communicate with one another in the farm as they lose connection in communication .Therefore, the IoT devices are not able to integrate with each other in one whole system . Communication issues related to the main problem could be due to some technical issues of the IoT devices , as some of the devices could have software and hardware errors . Therefore, some farming members might not know how to solve the issues as they could potentially lack knowledge in IoT devices. Network range could be a major factor , if the farm size is big some devices might not cover enough network range to transfer or connect data to another device . Hence, it probably leads to integrated IoT system not functioning . One of the most important factors also to consider is environmental conditions , as intense rainfall for example can cause heavy water flow going to devices . Therefore, leading to devices having damage in their performance or total complete failure of the device (Villa-Henriksen, et al., 2020) .

# Main research question

How can IoT devices communicate effectively with one and another in an arable farm ?

# Sub-questions

Sub question 1 : How can the technical issues for IoT devices be solved in an arable farm?

Sub question 2 : Which methods can be used to solve network range issues for IoT devices in an arable farm ?

Sub question 3 : What techniques can be used to protect IoT devices from unfavourable environmental conditions in an arable farm ?

# Objectives

Objective 1 : To identify the solutions for the technical issues of IoT devices in an arable farm.

Objective 2 : To investigate the methods for solving network range issues of IoT devices in an arable farm .

Objective 3 : To search for the protection techniques on IoT devices from unfavourable conditions in an arable farm .

# Research methodology and Type of data

The research methodology chosen for this proposal is a mono method and within the mono methodology it is a qualitative study . Objectives 1 , 2 and 3 will require qualitative type data.

# Data Source and Gathering Process

All three objectives will use secondary data such as journal articles to gather information. This data can be collected from journal articles such as (Villa-Henriksen, et al., 2020).

The data gathering process for all three objectives can be done through via online academic libraries such as EBSCO , Google Scholar , etc. All data gathered from these libraries should not be more than 5 years old .

# Data Analysis

Thematic data analysis will be conducted to all three objectives. Thematic analysis involves identifying key themes and patterns within a large body of text that link with the objectives.

# Outline risk or difficulties of the research approach execution

# Risk

Plagiarism : You should acknowledge the authors when utilising their sources when doing a research . Therefore , careful citation should be done when executing a research to avoid plagiarism .

# Difficulty

Choosing a research topic : When starting out research as a beginner , trying to narrow down and focus on a single specific topic can be issue .

# Bibliography

Dhanaraju, M. et al., 2022. Smart Farming: Internet of Things (IoT)-Based Sustainable Agriculture. *Agriculture,* 12(10).

Friha, O. et al., 2021. Internet of Things for the Future of Smart Agriculture: A Comprehensive Survey of Emerging Technologies. *IEEE/CAA Journal of Automatica Sinica,* 8(4), pp. 718-752.

Kumar, S., Tiwari, P. & Zymbler, M., 2019. Internet of Things is a revolutionary approach for future technology enhancement: a review. *Journal of Big data,* Volume 6, pp. 1-21.

Sinha, B. . B. & Dhanalakshmi , R., 2022. Recent advancements and challenges of Internet of Things in smart agriculture: A survey. *Future Generation Computer Systems,* Volume 126, pp. 169-184.

Villa-Henriksen, A. et al., 2020. Internet of Things in arable farming: Implementation, applications, challenges and potential. *Biosystems engineering,* Volume 191, pp. 60-84.