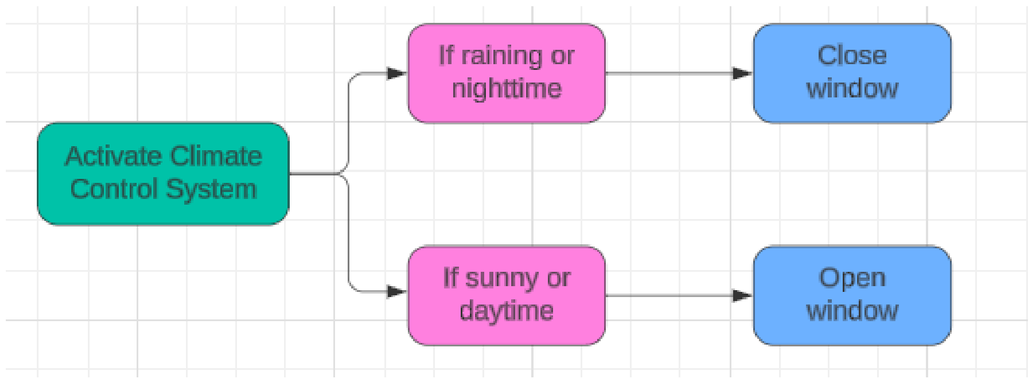
Faculty : Information and Communications Technology
Students : Chua Kek Yang Marcus 2301161,
Chua Yong Lin 2300907,
Goh Zhi Han Ambrose 2300462,
Lew JiaJun 2300984,
Seah Yi Long Clarence 2300986,
Tee Yu Cheng 2300884

Smart Home: Climate Control System

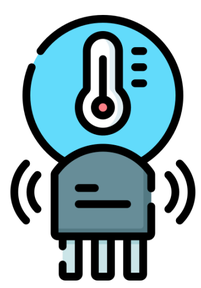
Problem Statement

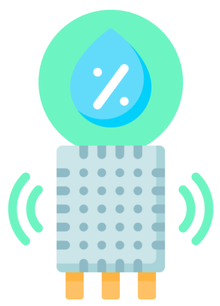
Predicting the environment such as whether it will rain and being physically there at that point in time to close the windows is not practical. As such, if unpleasant environmental conditions occur and there is a lack of human intervention, potential problems may arise.



Objectives

Develop an innovative management system that enhances the comfort and energy efficiency of residential environments. The system will intelligently control windows and lights based on real-time weather conditions, ensuring optimal climate control while minimizing energy consumption. By leveraging sensors and automation technology, the system will dynamically adjust window positions and lighting levels to adapt to changing weather patterns such as temperature, humidity, and sunlight intensity.


"Temperature Sensor"


"Humidity Sensor"

"UV Sensor"

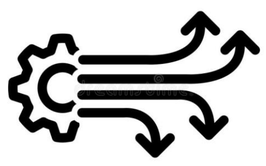

"Light Sensor"

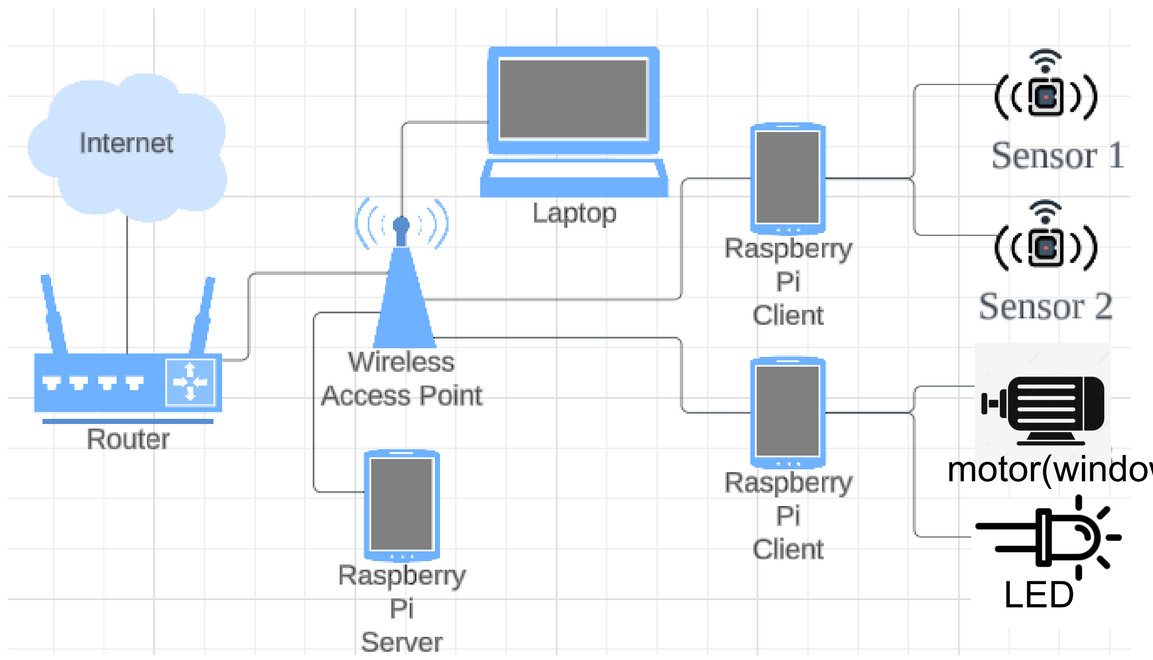
Solution

Implement an IoT network architecture utilising multiple Raspberry Pi's with the respective sensors attached to them to perform tasks such as closing the window accordingly when the environmental factors match the thresholds set.

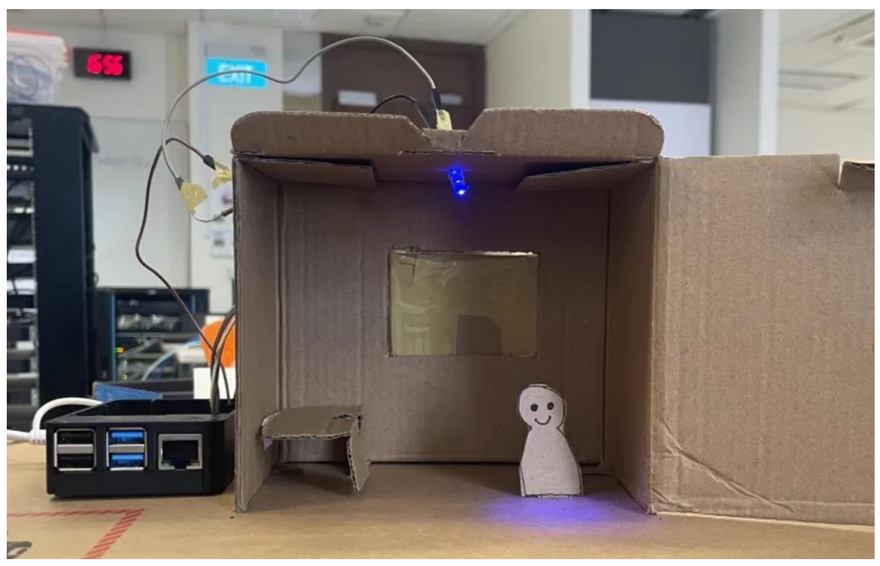
Implementation

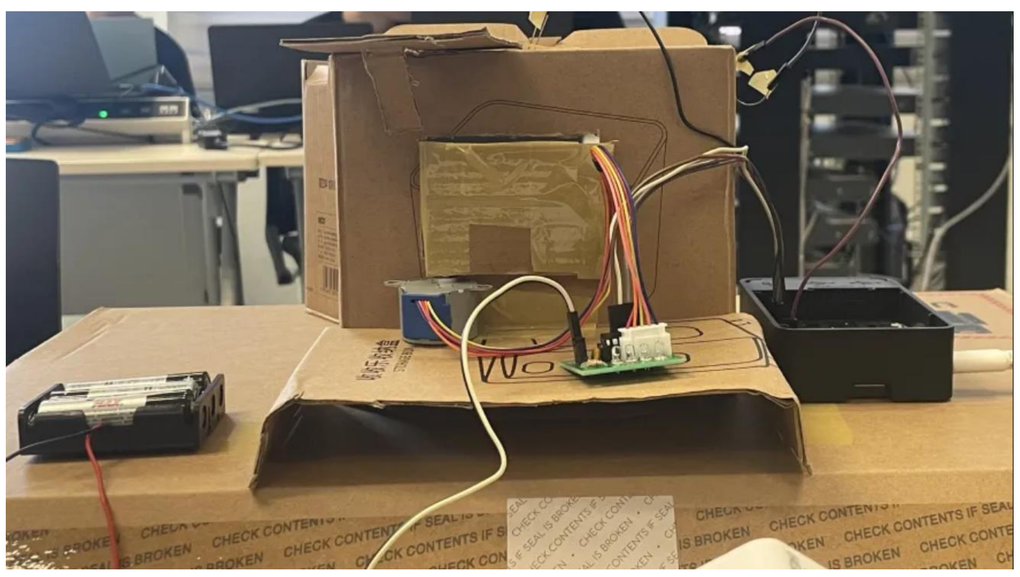
Wireless communication is utilised between all devices.





Climate Control System Prototype





Control Panel