



**Galway-Mayo Institute of Technology**  
Bachelor (Hons) of Software & Electronic Engineering

# **House Hestia**

## **IoT Smart Home Automation System**



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**Project Plan**

## Acknowledgements

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### Summary

The rationale underpinning my decision to choose home automation as my FYP project is based on several factors: my current interest in home automation, my recent internship at Intel and my hobbies which included design structures and models, but most importantly I think it has to do with an article that I read In the Sunday Irish Times.

Initially, the objective of my project was to have a website hosted on a server where the user could access and control their house remotely which would, in turn, automate their day-to-day tasks. However, during the regular meetings that I had with my supervisor regarding my project, My perspective on my project changed, so much so, that the goal of the project was now geared towards Container technology, the use of Amazon’s AWS to have my Home automation system accessible from any in the world from any IoT device.

My system is composed of two development platforms: the ESP32 microcontroller and the Raspberry pi 4. The platforms host the following sensor which holds the responsibility of monitoring and controlling the house: Pi Camera, Fingerprint Sensor, multiple LEDs, and Servo motors, PIR ultrasonic sensor, smoke sensor, fingerprint sensor, piezo buzzer, motion sensor. Also, incorporate in .my project is the use of AWS Kinesis which is used to a steam facial recognition camera surveillance. In additions to my project, I have a website that is hosted inside an AWS EC2 instance which shows the operations of the house. Also, I implemented Docker container technology into my project as an experimental aspect. I will revisit this aspect further in my report.

The leading technologies I used include MQTT, HTTP, IFTTT, Webhooks Web-sockets, JS, jQuery, AWS, Docker, Docker compose, the MEAN Stack and HTML/CSS. The MQTT Broker is Hosted on AWS IoT Core. The micro-controller esp32 and the pi4 connect to the MQTT broker allow live data communication which is visualized on the AWS IoT Core. This data is then showcased On the EC2 using NodeJS, Express and the AWS SDK.

The scope of my project encompasses the implementation of Agile tactics intending to make the execution of project possible, and this includes multiple trials and tests to ensure that my project works the way that I envisioned.

Finally, the data that I collected from the multiple trials and tests that I carried out was satisfactory because it showed that my project was fully functional and could be implemented correctly as I intended.

## Phases

the project has been divided into the following project phases. Splitting the project into these phases is crucial for the project completion

**Initiation Phase** The initiation phase is the initial part of the project plan, which details the major factors such as the critical assumptions and constraints, preliminary requirements, and potential risks.

The planning phase in its very name is the next step of the project plan and is constructed and defined to plan the entirety of the project plan

**Execution, Monitoring and Control Phase** Lastly, there must be a factor/measure that notifies us of any risks that I may face during the execution of the project plan

## Requirement List (Functional and Non – Functional)

Listed below are the following functional and non-functional requirements for the project

### **Functional requirements**

- The system must be able to process and accept various forms of input via the website interface.

- The system must be able to handle the request coming through the system and then have a way of temporarily storing the information temporarily to execute the requests.
- The system must include having an admin page with administrator privileges.
- The system must allow the users to check their house system and account credentials.
- The Application system must be able to successfully validate and confirm the user's signing in and out.
- The website interface must be integrated into the ec2 instance to AWS.

### **Non-functional requirements**

- The system must be accessible via the website interface created and electronic devices that can run the software
- The user must have access to the system to view their house
- The system must be able to output the relevant informant needed for the home system control panel on the website.
- Users must be able to get view payments that they have made of their order via the GUI
- The system must be easy to use for user
- The system must secure all data and be protected against attacks
- The system must be scalable, maintainable, and available to users on use

## Work Breakdown structure (WBS)



## Gantt Chart

