**The 24/7 Gardener.**

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# **Proposal.**

The original idea of this project was to be an indoor garden, where like snake plant Peace Lilly and Spider plants would clean and recycle air then I would be able to measure the oxygen levels and carbon dioxide and display this to the user using an android application.

But from research of different ideas I would also like to try grow fruit and vegetables using robots and be able to set thresholds, for example if the soil because too dry the system would know how to water all plants.

# **Research.**

There were multiple different types of systems out there, the first I will review is The Raspberry Pi Powered Garden.

## **The Raspberry Pi Powered Garden.**

A picture containing ground, outdoor

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The objective of this garden was to be able to maintain the well-being of the garden using the power of the Internet of Things (IoT).

A raspberry pi would connect to some sort of online database via WIFI, and the user would then be able to monitor and control via a smart phone app.

Some of the features built int othis garden include:

* Real-time feedback of the garden's various sensors.
* Database of the garden's health status.
* Global monitoring and operating capacities.
* Drip irrigation system.
* App controlled water system.
* Automatic watering schedules.

Electronics included:

* Raspberry Pi3 Model B
* Grove Pi + Sensor Shield
* 12V Solenoid Valve
* Humidity and Temperature Sensor (dht11)
* Moisture Sensor
* Luminosity Sensor
* Relay Module
* 12V Power Supply

How they designed the app was very interesting they used MIT’s app inventor rather than android studio, they wired all sensors to the PI via a sensor shield and sent all data over WIFI to a firebase database.

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Graphical user interface, application

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The end game product from this type of garden was healthy and managed to grow herbs such as mint and coriander.

## **The Automated Garden System Built Of Raspberry PI For Outdoors or Indoors.**

This type of garden project works is it used the Raspberry pi and smaller microcontrollers like Arduino in a master slave wireless configuration it then displays this data to the user using MudPi which is a automated gardening system.

It looks as if this MudPi system is a type of Raspberry Pi Operating system that reads sensors from the Raspberry Pi’s pins the type of parameters they measure in this project include Temperature, Humidity, and Water levels the reason why they use Arduino is that the Raspberry Pi is digital GPIO only and cannot read analogue sensors.

A picture containing graphical user interface

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MudPi is used because it has support built into control Arduino and wireless ESP devices as slave nodes.

It basically makes the Raspberry Pi the main controller and then the others the sensor units.

Graphical user interface, application

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A picture containing grass, kitchen appliance

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## **Smart Home Gardening System Using Raspberry Pi.**

The idea of this project is a simple garden plant watering system.

Diagram, schematic

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Many people invest in a garden, but they fail to maintain it when they go for a vacation or often forget to water the plants.

Plants will shrivel up and die, to prevent plants from being shrivelled and dead, in our project we are building a system that detects if there is a need for watering the plants and if so, the water will be sprinkled onto the plants automatically without the need of human assistance.

The system is built using a soil moisture sensor and a Raspberry Pi-controlled water pump.

The soil moisture sensors measure the amount of water in the soil to maintain consistent and ideal soil conditions for plants.

In this project, the soil moisture sensor interfaces with the Raspberry Pi, which then detects the dryness in the soil; if the moisture level is very low, this implies there is a need for watering the plants.

It signals the Raspberry Pi about the moisture level being too low.

The Raspberry Pi turns on the water pump to start watering the plants until the soil achieves a sufficient moisture level and then turns off the water pump.

# **List of Technologies.**

Just by studying these projects they all had some things in common, they all had a main mother board, they all used some type of sensor to measure different quantities, they then updated a database somewhere and then the data was displayed to a user either through an LCD screen, or android app, or web application.

## **Main Board.**

I researched 3 boards and compared them for best results.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Board** | **GPIO** | **WIFI** | **Bluetooth LE** | **Storage** | **RAM** |
| Raspberry Pi | 40 Pin | IEEE 802.11.b/g/n/ac wireless LAN | Bluetooth 5/BLE | MicroSD | 1GB, 2GB or 4GB LPDDR4 SD RAM |
| NanoPi NEO3 | 26 Pin | Gibabit Ethernet | N/A | MicroSD | 1GB, 2GB |
| BB-POCKET | 40 Pin | Gibabit Ethernet | N/A | DRAM | ‎4 GB |

## **Sensors**

## **Database.**

## **Application.**

# **Project Processes.**

# **Stake Holders**