Home grown fruits and plant

**Aim**

Successfully assemble and operate an Indoor Automatic Plant Watering System (APWS) using Raspberry Pi 3.

Goal 1: Design the model

It is important that we have the 3D printed parts modeled and measured in software before buying other accessories accordingly. The parts that need to be modeled and printed are: Raspberry Pi and LCD housing, Sensors' housing. Before doing this stage of the project, we will need to sketch out the ideas and the rough design of the casings together before 3D modeling them to save time and effort.

After that, a simple model of the whole system will also be made in 3D so that we can estimate the materials that we need to assemble it.

Goal 2: Write the codes for the software to run on Raspberry Pi 3.

This is a crucial step for the whole model to function as this will be the 'brain' and control other components of the product. At this stage of the project, the program only need to read the moisture level of the soil and activate the pump accordingly. Moisture levels will be set at different values for different types of plants or according to the user’s need.

Goal 3: Acquire all the necessary parts and assemble them.

For this project, we will need to buy several parts that is required for the model to function.

These parts will include a Raspberry Pi 3, 3.5in LCD screen to monitor the system, Packet of GPIO Wires, Soil moisture sensor(s), 8 Channel Relay Module, Hydroponic Light, small water pump, PVC tubes/hoses and drip nozzles for watering the plants, pots, soil, seeds/plants of choice.

**Roles**

As per ideal job description in assignment 2 and personal skills set, we decided to assign each member of the group a role in developing this project for better work distribution and management. The roles are as follow:

Lead Developer: Mike – manages the overall process of the project, keep track of other members' progress.

Website Developer: Thomas – manages our website for the project

UI Designer: Victoria – focuses on the Interface design of our software on the Raspberry Pi.

Model Designer: Dat – 3D models parts of the project and calculate the materials needed

Software Developer: Braden – focuses on developing the app driving the model

Testing – Risk manager: Franklin – researches on Regulations, Risks and later tests and fine-tunes the model.

**Scope and Limits**

The scope of this project is to successfully build a functional Indoor Automatic Plant Watering System with 2 different types of plants which are chili peppers and mint in 2 pots. These plants are easy to grow and only need regular watering so it works the best in our test model. In the given timeframe, we are aiming for the proof of concept and the estimated price of the final product. We understand that this is not new and has been done in different approaches, however, what we are aiming for might set us apart. With the materials that we use, the cost of the product will be kept at minimum and there will be no limitation to what the end user can achieve. This is because our model is modular and can be programmed to work with different types of plants so that it can fit different people's need. That being said, the possibilities are unlimited, but we will limit our project to only automatic watering the plants based on the soil moisture and optimized for two specific plants that we chose to test in our model.

**Tools and Technologies**

Software: Since we are programming in Python which can be download (free) from <https://www.python.org/>, we will need a laptop, a micro-SD card reader to transfer files for the Raspberry Pi to load. Braden and Victoria will be working on this together in order to bring the app that is easy to use and customizable to the users.

The 3D modeling will be done on Autodesk's software and are free to use for current RMIT students. Dat will be working on this as he has experience working with the software.

Hardware: We will need a 3D printer and one of our team members - Michael owns one and already had experience using it. We will also need basic power tools to assemble the model.

Other Tools are listed in the Aim section.