**Product Design Specification**

**Group 12**

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**Executive Summary/Concept of Operations:**

The intention of our project is to create a device that can monitor the moisture level in soil, to then appropriately open a valve to water a plant. For our project, the valve is an emulation of the device being hooked up to some real water source. It is targeted towards the average consumer, but can be used in many different applications: can be useful for plants that need to be watered rarely (potentially store historic data and water accordingly), used in any application where self-watering is required (can change watering amount decision criteria as needed), or is useful in accurately watering a plant the required amount (no overwatering, potential area to conserve resources in).

**Brief Market Analysis:**

The intended customers of our product are homeowners, renters, anybody with some sort of small to medium sized plant, potted or in the soil. Our product is looking to be sold around the $20 mark, as it can only serve one plant. In the future, a potential update to our product model would be to sell extension tubes so one unit could water multiple plants at a time.

**Requirements:**

* Must measure relative moisture content
* Must distribute water depending on relative moisture content
* Should retain semi-historic data and take it into account when decision making
* Must run on 9V battery
* Should interface to LCD screen for easily viewable information
* Should be portable

**System Architecture:**

INSERT BLOCK DIAGRAM HERE

**Design Specification:**

* Sensor: TBD
* Actuator: Plastic Water Solenoid Valve - 12V - 1/2 Nominal, 3-116 PSI (0.21 ~ 8 bar), Connection Method: Threaded ½” NPS, 0.01 lb (4.54g)
* ATMEGA32U4 AVR 8-Bit Microcontroller, Max Clock Frequency: 16 MHz, Program Memory Size: 32 kB, Data RAM Size: 2.5 kB, ADC Resolution: 10 bit, Number of I/Os: 26 I/O, Operating Supply Voltage: 2.7 V to 5.5 V
* Arduino programmer