

Aqua Growth

SOLUTIONS

Initial Idea

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Introduction:

Our concept revolves around a water flow sensor designed to offer a range of data insights. Accompanying this sensor is a user-friendly mobile application, which will be accessible through a tiered subscription model. Our ultimate aim is to create seamless synergy by integrating the water flow sensor with a moisture sensor, enabling automated watering cycles, and exploring the potential for additional automation features. There are various problems that this product aims to solve. First, it would save time and money (since time is money nowadays that's a lot of saving). It saves time because, with the automated features, you would not have to take the time out of your day to water your garden. It saves money by providing analytics that you can use to understand how much water you are using as well as how you can reduce that usage. This product will have a sustainability focus. Climate change has never been more clear with massive droughts, so this product will help mitigate your water usage as much as possible.

Team, Skills, Roles Dynamics:

Our current team is composed of six dedicated individuals: Jeet, Noah, Daniel, Alexander, Megan, and Jaxon. This team formation emerged organically through class bonding and collaboration during the initial weeks of our course. While prior to this collaboration, the team members did not share extensive pre-existing relationships or collaborative experiences, we discovered a shared passion for addressing water-related challenges. Each member brings a unique skill set to the table. Jeet Patel contributes as a Developer, showcasing expertise in Frontend Programming, Python, and API Integration, along with proficiency in Kotlin. Noah takes on the role of Project Manager, bringing a wealth of experience in Relative Microcontroller Operations, 3D Printing, and Backend Programming. Daniel plays a role as a Hardware Tester and Developer, boasting skills in Microcontroller Operation, Presentation, Python, and API

Integration. Alexander, a Certified Gardener with a green thumb, specializes in Backend Programming, Databases, and Swift. Megan is a developer who has experience in languages such as Python and Kotlin and has done Backend Programming. Jaxon is a programmer familiar with databases, networking and languages such as Java, C++, C, Python.

Expected Challenges:

During the prototype phase, one of the primary hurdles we anticipate is the procurement of the necessary components. Additionally, a significant challenge lies in the design of the water flow sensor itself. It's imperative that we ensure its waterproof properties, all while maintaining a sleek and aesthetically pleasing form factor when attached to a hose. The complexities of enabling wireless data transfer pose another substantial challenge. Moreover, contemplating the feasibility of making the entire device wireless is a concern, considering potential cost implications. Lastly, we must strategize how best to integrate the moisture sensor seamlessly into our system, addressing compatibility and functionality issues.

Solution:

Our design strategy revolves around an iterative approach, aiming to create numerous prototypes for testing and refinement. We're fortunate to have a team member with access to a 3-D printer, enabling us to produce cost-effective mockups for experimentation. We'll also conduct thorough comparative analyses of existing devices in the market to gather insights for our design. To keep costs in check, we'll explore the availability of used and affordable components on platforms like Amazon, marketplaces, or OfferUp. Knowledge sharing among team members with 3-D design experience will facilitate collaborative mockup creation. Success in this endeavor hinges on our ability to iterate and refine our prototypes continuously. For

wireless data transfer, our plan is to leverage microcomputers, although the precise implementation is still under consideration, presenting another challenge to address.

Software Theme:

Are you eager to save money, conserve water, and nurture your houseplants effortlessly? The Automated Sprinkler System is a must-have for California homeowners and plant enthusiasts. With a User-Friendly and Do-It-Yourself design, our smart sprinkler system, powered by a Raspberry Pi 4, seamlessly integrates advanced moisture sensors, water flow sensors, and real-time weather data. It's not just a sprinkler, it's a sophisticated garden companion that optimizes your plant care routine by automating a healthy growing environment for your houseplants. Aside from our device, the Automated Sprinkler Smart App will effortlessly connect your phone via Bluetooth or Wi-Fi, placing the power of plant management directly in your hands. Additionally, the Smart App will be equipped with a Digital Dashboard to display your weather readings, moisture readings, and water usage in one place. With all this valuable information, you can automate your sprinkler to water your garden by providing an optimal amount of water, ensuring your garden thrives while conserving water and saving money in California.

Market Analysis:

With the increase in environmental concerns and the importance of resource conservation, a growing market segment is emerging. Aqua Growth Solutions focuses on middle-class homeowners, gardeners, and environmentally conscious individuals, who are also eager to save money while contributing to a greener planet. In 2020, the smart irrigation market size had been valued at \$1.44 billion and is expected to increase to \$5.57 billion by 2030. The market is looking for solutions to help conserve water efficiently and still meet their gardening

needs. It is primarily driven by the increasing importance of water conservation, the appeal of automation, and ease of use through user-friendly, mobile app-controlled devices.

Name	Rachio	Orbit B-Hyve	Netro
Strengths	User-friendly interface, smart weather integration, smart home capability.	Budget-friendly, weather integration, remote access.	User-friendly interface, waterproof capabilities.
Weaknesses	Expensive and depends on wifi connection.	No smart home compatibility Complicated Interface.	Limited smart home integration and lack of advanced customization.

A few key competitors include Rachio, Orbit B-Hyve, and Netro smart watering devices. Rachio provides a user-friendly interface, weather integration, and home capabilities. Listed above is a table showing the key strengths and weaknesses of Rachio, Orbit B-Hyve, and Netro. Our budget-friendly, smart watering device aims to provide a plug-and-play solution while having a user-friendly interface. Additionally, our plan is to provide smartphone capabilities that have weather integration, a digital dashboard, and push notification features.

Value Proposition:

Our Automated Sprinkler System offers cutting-edge water management capabilities, allowing you to optimize your garden's watering schedule based on real-time weather data and soil moisture levels. This intelligent system ensures your plants receive just the right amount of water, not too much and not too little, reducing water wastage and promoting healthier growth. Unlike some competitors with complicated interfaces, our Smart App boasts an intuitive and user-friendly design. You don't need to be a tech expert to operate it. The Digital Dashboard consolidates vital information in one place, making it easy for users to monitor and adjust their

garden's care settings effortlessly. We provide users with a high level of customization and control over their garden's care. Adjust watering schedules, set preferred moisture levels, and receive push notifications when it's time to water or when rain is expected. Our system puts the power of plant management directly in your hands. We are committed to sustainability without breaking the bank. Our cost-effective solution empowers homeowners and gardeners to contribute to water conservation efforts while enjoying substantial savings on their water bills. It's a win-win for both your wallet and the environment.

Monetization Strategy:

Aqua Growth Solutions primary source of income would be from an initial one-time purchase. With the cost per unit being roughly around \$40, our selling price would be around \$55 minimum to secure a 30% profit margin. With a one-time purchase, customers will have access to the accompanying mobile application to monitor their plants.

Component	Cost
Soil Moisture Sensor	\$7
Water Flow Sensor	\$7
Raspberry Pi	\$15
Power Supply	\$10
Misc (Cables Etc.)	\$1
Casing	Variate depending on material
Total	\$40

Conclusion:

In conclusion, our Automated Sprinkler System is a Cost-effective and User-friendly solution for California homeowners and plant enthusiasts alike. With its innovative blend of water flow sensors, moisture sensors, and real-time weather data integration, it offers a new level of convenience, water conservation, and cost savings in garden care. We are proud to present a user-friendly, plug-and-play product that not only simplifies plant management but also contributes to a greener planet. Our competitive pricing at \$55 ensures accessibility while providing an excellent profit margin for Aqua Growth Solutions. We believe this product represents the future of smart gardening, and we invite you to embrace it, as it promises to revolutionize the way you nurture your garden while championing sustainability and resource conservation. Join us on this exciting journey toward a smarter, greener, and more prosperous gardening experience 🌱🚀🌙.

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