Project Deliverable C: Design Criteria and Target Specifications

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Objective

The main purpose of this deliverable is to construct a list of prioritized design criteria, perform benchmarking and determine target specifications. In addition, the report will discuss how the client meeting impacted mentioned aspects.

Design Criteria

- Functional requirements
    - Able to hold around 20 plants.
    - Drain water properly.
    - Must be placed on wheels for easy moving.
    - Stability: wheels must be locked when not moving.
    - Fail-safe when water is leaking.
    - Notification to change water.
- Constraints
    - Weight (lbs): must be light enough for the students to move/carry.
    - Cost ($): must be below $100; can go above a bit but it must be very convincing.
    - Size ($L \times W \times H\, ft$): when stored, must be small enough to fit inside the elevator; when deployed, must be manageable for younger/disabled students.
    - Operating conditions: wet, humid, dirt.
- Non-functional requirements
    - Aesthetics
    - Product life (years)
    - Corrosion-proof
    - Safety: minimal pinch point
    - Reliability

Benchmarking

This design shows a good way to distribute the water between all the plants in a cost effective way. Problems include that the bucket could fill up with water and it would be difficult for young children to move. Also it would be difficult for the children to move the things that the plants go in. The materials used are similar to our current idea but this design may be too heavy and difficult to transport in elevator.

Idea for designing plants to be plated in this layout would be good because it secures plants in a secure position that could be easily transported. Although the picture looks like this design could take up a lot of space in a room and watering all the plants may be difficult to implement.

The layout in this design would be good because it is compact enough to fit in a small space in the room and could be put on wheels and moved with little force. It is also small enough to fit in an elevator and as long as the height is not overly tall it would work well with children working on it.

Design Specifications

- Around 4-6ft tall
- Column for holding plants 4-5ft long
- Lights on timer 12 hours (on/off)
- 50-75 liter reservoir
- Entire system should be under 150lbs
- Must plant at least 20 plants
- If backup reservoir include at least hold 25L of water

Reflect

When designing our product, a number of factors not outlined by our clients will be kept in mind when creating our project. The system will aim to be as intuitive and user friendly as possible as to not take away from the learning and amount of people who will understand and be able to utilise our project. Our product will be aimed at being as accessible to our clients as possible. Keeping this idea of accessibility in mind, we will also have to ensure that it remains cost efficient and cheap to manufacture. This allows users from all walks to life to possibly eventually benefit from our product.

Conclusion

This project will be one that requires an indepth look into the various problems noted from previously utilised models of this project. Some of these shortcomings that will be addressed include a height and dimensions suitable for a classroom environment, that also can be easily moved around, and fit into an elevator. The current water system should also be efficient and have a fail safe. It must be able to be easily handled and filled by children in the most efficient way possible. While implementing these changes and improvements in our designed hydroponics system, we will have to make a conscious effort not to create more problems that were not experienced by the previous projects. If this is all done to the best of our ability, we will hopefully be able to design a suitable product prototype for our clients.