Deliverable -B-

Need Identification & Project Statement

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1. General Information & Briefing

1.1. General

Growcer is a hydroponics company that provides easy and compact farming for rural and urban communities. Through this process of growing leafy greens floating in water, a problem of algae growth arises. A large amount of time and labour is spent weekly on maintaining and cleaning the "rafts" which the vegetation is grown. If this algae is left uncontrolled or improperly cleaned it can lead to fatal damage to all vegetation involved. With this information it has become a priority to find a new and more efficient way to maintain these rafts. This all must be done without compromising the integrity and the morals of the company. These beliefs are to maintain a natural growing process while limiting space and resources used, to produce a green and renewable source of food for communities who may lack the availability.

1.2. Stakeholders

- Clients.
- Farmers.
- Grocery Stores.
- Vegetable buyers.
- Rural Communities.
- Agricultural fields.
- Plant enthusiasts.

1.3. Similar designs

- Magnetic Algae scrapper.
- Rainfall mountable algae cleaner.

There are two diverse types of algae cleaning designs: algae scrappers and algae cleaners. These two designs are popular for fish tanks or other small things like rain gutters around the house. There have been some configurations to clean algae from certain lakes and rivers that may be pertinent.

- Some ideas include:
  - Ultrasonic algae control.
  - Chemical control.

- Aeration.
- And mixing.

2. Needs Statement & Prioritization (Q2)

Question	User Statements	Needs
Typical Uses	▪ I need an automated machine that cleans algae off the rafts. ▪ I need it to be less than 8 hours of labour. ▪ I need it to be easy to use. ▪ I need it to be compact (Wall mount or table).	▪ The product is automated. ▪ The product works within a defined timeframe. ▪ The product is user friendly. ▪ The product is compact in size.
Likes	▪ I like when it's affordable. ▪ I like it to be efficient. ▪ I like it to minimize water usage.	▪ The product is cost efficient. ▪ The product is reliable. ▪ The product considers water usage.
Dislikes	▪ Pesticides hurt plant roots, so I don't like them to be used ▪ The lettuce and vegetables mold with moisture, so I want humidity control.	▪ The product limits or does not use dangerous chemicals. ▪ The product controls moisture content and drains it away when needed.
Suggested Improvements	▪ I suggest having a high customer focus (make them happy). ▪ It would be better if it considers both climate and temperature.	▪ The product has a good client satisfaction rate. ▪ The product is capable of monitoring both humidity and temperature.

3. Organization and Prioritization (Q3)

Numbers	Needs	Importance
1	- The product is automated.	1
2	- The product works within a defined timeframe.	2
3	- The product is user friendly.	2
4	- The product is compact in size.	3
5	- The product is cost efficient.	2

6	- The product is reliable.	1
7	- The product considers water usage.	5
8	- The product limits or does not use dangerous chemicals.	3
9	- The product controls moisture content and drains it away when needed.	4
10	- The product has a good client satisfaction rate.	3
11	- The product is capable of monitoring both humidity and temperature.	5

4. Problem Statement formulation (Q4)

The client needs an automated, reliable, and cost-efficient device that would safely clean algae build up on the rafts while limiting dangerous chemicals that would compromise the produce quality.

5. User Benchmarking (Q5)

Numbers	Needs	Metrics
1	- The product is automated.	Automation pass rate (%).
2	- The product works within a defined timeframe.	Hours.
3	- The product is user friendly.	- Task success rate. - Perceived success. - Error rate.
4	- The product is compact in size.	- Dimensions (meter). - Total volume (meter cubed).
5	- The product is cost efficient.	Cost ($).
6	- The product is reliable.	The number of boards per hours.
7	- The product considers water usage.	Water quantity (gallons).
8	- The product limits or does not use dangerous chemicals.	Concentration (ppm).
9	- The product controls moisture content and drains it away when needed.	- Relative Humidity (%)
10	- The product has a good client satisfaction rate.	- Polls and feedback.

		▪ Statistics (%).
11	- The product is capable of monitoring both humidity and temperature.	- Moisture Content (RH %). ▪ Temperature (℃).

6. Continuous work (Q6)

For the future of our design team, we are planning to maintain a constant professional level towards our projects and will look to improve our ideas. There are many team deliverables throughout the term. We plan to continue our work and hope to improve our designs.

7. References

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