Deliverable -C-

Design Criteria & Project Target

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1. Research of similar products:

a. E20 Robotic Pool Cleaner (Product 1).

b. M600 Inground Robotic Cleaner with Caddy (Product 2).

c. Awesome Pond Clean Hands Foam Free Pond Filter (Product 3).

2. Technical Benchmarking

- ***Functional requirements***:
  - Removing Algae
  - Automation
  - Variable Cycles
  - Use Safe Chemicals
  - Safe to use
  - Water reservoir capacity
  - Controls humidity
  - Monitors temperature
  - Filtration System
- ***Constraints:***
  - Cost ($).
  - Cycle Time (min).
  - Capacity (gal).
  - Weight (lbs).
  - Dimensions (cm x cm x cm).
  - Energy (Watts).
  - Life Warranty (years).
- ***Non-functional requirements*:**
  - Compact
  - Easy to use
  - Easy to Maintain
  - Low Power
  - Cost Efficient
  - Durable
  - Convenient
  - Reliability
  - Quie

2.1. Benchmark table:

	Importance	Product 1	Product 2	Product 3
		E20 Robotic Pool Cleaner	M600 Inground Robotic Cleaner with Caddy	Awesome Pond Clean Hands Foam Free Pond Filter
Company		Dolphin Explorer	Dolphin Explorer	Aquagarden
o Cost	2	$899 (CAD)	$2146 (CAD)	$312 (CAD)
o Cycle Time	1	2 hours	2.5 hours	∞ (continuous)
o Capacity	1	4000 gallons	4491 gallons	300 gallons
o Weight	5	23.848 lb	51.7 lb	11.82 lb
o Dimensions	5	59.7 x 48.3 x 48.3 (cm x cm x cm)	59.43 x 49.53 x 48.54 (cm x cm x cm)	39.6 x 39.6 x 17.8 (cm x cm x cm)
o Energy	3	120 W	120 W	12 W
o Warranty	4	2 years	3 years	2 years

2.2. Metrics table:

Company	Importance	Dolphin Explorer	Dolphin Explorer2	Aquagarden
o Cost	2	$899 (CAD)	$2146 (CAD)	$312 (CAD)
o Cycle Time	1	2 hours	2.5 hours	∞ (continuous)
o Capacity	1	4000 gallons	4491 gallons	300 gallons
o Weight	5	23.848 lb	51.7 lb	11.82 lb
o Dimensions	5	59.7 x 48.3 x 48.3 (cm x cm x cm)	59.43 x 49.53 x 48.54 (cm x cm x cm)	39.6 x 39.6 x 17.8 (cm x cm x cm)
o Energy	3	120 W	120 W	12 W
o Warranty	4	2 years	3 years	2 years

Better = 3
Midrange = 2
Worse = 1

2.3. Benchmarking – Quantification table

Company	Importance	Dolphin Explorer	Dolphin Explorer2	Aquagarden
o Cost	2	2	1	3
o Cycle Time	1	3	2	1
o Capacity	1	3	3	1
o Weight	5	2	1	2
o Dimensions	5	2	2	3
o Energy	3	2	2	3
o Warranty	4	3	2	3
	Total:	**17**	**13**	**16**

--> **Product 1 – Dolphin Explorer** wins by criteria quantification.

2.4. EDS Functional Requirement Table:

	Design Specifications Functional requirements	Relation (=, < or >)	Value	Units	Verification Method
1	Removing Algae	=	yes	N/A	test
2	Automation	=	yes	N/A	test
3	Variable Cycles	<	10	hours	analysis
4	Use Safe Chemicals	=	yes	N/A	test
5	Safe to use	=	yes	N/A	test
6	Water reservoir capacity	>	4000	gallons	test
7	Controls humidity	=	yes	%RH	estimate, test
8	Monitors temperature	=	yes	°C	estimate, test
9	Filtration System	=	yes	N/A	test

2.5. EDS Constraints Requirement Table:

	Design Specifications Constraints	Relation (=, < or >)	Value	Units	Verification Method
1	Cost	<	1000	CAD $	estimate
2	Cycle time	<	5	hours	analysis
3	Capacity	>	3000	gallons	estimate, check
4	Weight	<	50	lb	test
5	Dimensions	=	60 x 50 x 50	cm x cm x cm	test

6	Energy	<	130	W	test, check
7	Warranty	>	2	years	test

2.6. EDS Non-Functional Requirement Table:

	Design Specifications Non-functional requirements	Relation (=, < or >)	Value	Units	Verification Method
1	Compact	<	0.15	m^3	test
2	Easy to use	=	yes	N/A	test
3	Easy to Maintain	=	yes	N/A	test
4	Durable	=	yes	N/A	test
5	Convenient	=	yes	N/A	test
6	Reliability	=	yes	N/A	test
7	Quiet	<	?	dB	test

3. Analysis & Reflection

The client meeting helped clarify certain questions or concerns about the design and even the design process. From taking all these statements, the team was able to identify the needs from the specifications which allowed arranging all possible ideas in a logical manner and filter out all written thoughts during brainstorming sessions.

The preceding deliverables have changed our thought processes and the way we imagine our final design. Even though the requirement is not to come to any conclusion, as human beings we keep imagining how the final product would look like. That mental prototype changes as the design process comes to life.

The considered companies have all shown effective products to the main need. And as such, every criterion in our project has been explored and evaluated with a certain level of importance. The deliverable B took our client statements and mainly organized them, so it was clear to any other what our clients' needs were. This Deliverable C has considered the client's needs from the previous project and has forced our team to research the best potential products as well as their requirements that will be helpful towards our final project.

4. Project Management & Wrike

Working through the process Deliverable C it was extremely linear in the workload. As we see through Wrike that many of the steps depended on one another, with we had to maintain and create reasonable and efficient time slots for each task/topic. In Wrike we will see that we used the "Dependences" to display and create a "Timeline" which effectively help us as a group manage and decide what tasks to prioritise and which to leave towards the end. This linear style of worked forced us to work in a parallel fashion to complete the project effectively and efficiently.

5. Conclusion

The present deliverable allowed the team to better focus on the product needs in a more technical and appropriate manner. The client's needs have been revised and constraints have been better evaluated. The research and team brainstorming allowed the design to become more accurate as to solving the problem statement. The future deliverables will encompass such information and would hopefully allow our design to become a realistic prototype.

6. References:

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“Pennington Aquagarden Filtre de bassin pour bassins, ensemble de filtres en mousse, tampons de filtre en laine polymère, kit d’entretien de bassin, convient pour Inpond 5 en 1, modèle de 600 gallons, blanc, taille L (compatible avec 600) : Amazon.ca: Animalerie.” n.d. Accessed October 9, 2022. https://www.amazon.ca/Pennington-Aquagarden-Inpond-Large-Maintenance/dp/B009LSHY2E?th=1.