Team B21 : Waterproof hearing aid

Project Deliverable E: Project Progress Presentation

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Project Outline

Problem statement: To design and produce a functional set of waterproof hearing aids while still optimizing the functionality and user experience for people who suffer from hearing loss

Customer Needs

Metric #	Needs	Metric	Importance	Units
1	1	Battery life	5	Hours
2	3	Water resistance	3	IPXX
3	4	Rechargable	5	Binary
4	5	High quality microphone	5	kHz
5	6	Hearing aid size	4	cm^3
6	8	User satisfaction	5	Subjective
7	2	Easy to clean	4	Subjective

Benchmarking

Company	Philips Hearlink	Phonak Brio 4	Kirkland Signature 9.0	Starkey Livio
Cost	$1249.99	$1249.99	$1499.99	1580.00
Water Resistance	IP68	IP68	IP68	IP58
Weight	Not specified	Not specified	Not specified	Not specified
Battery	Disposable	Disposable	Disposable	Rechargeable
Estimated Battery Life	18 hours	18 hours	18 hours	16 hours
Fit	Behind the ear (BTE)	BTE	BTE	BTE

Target specifications

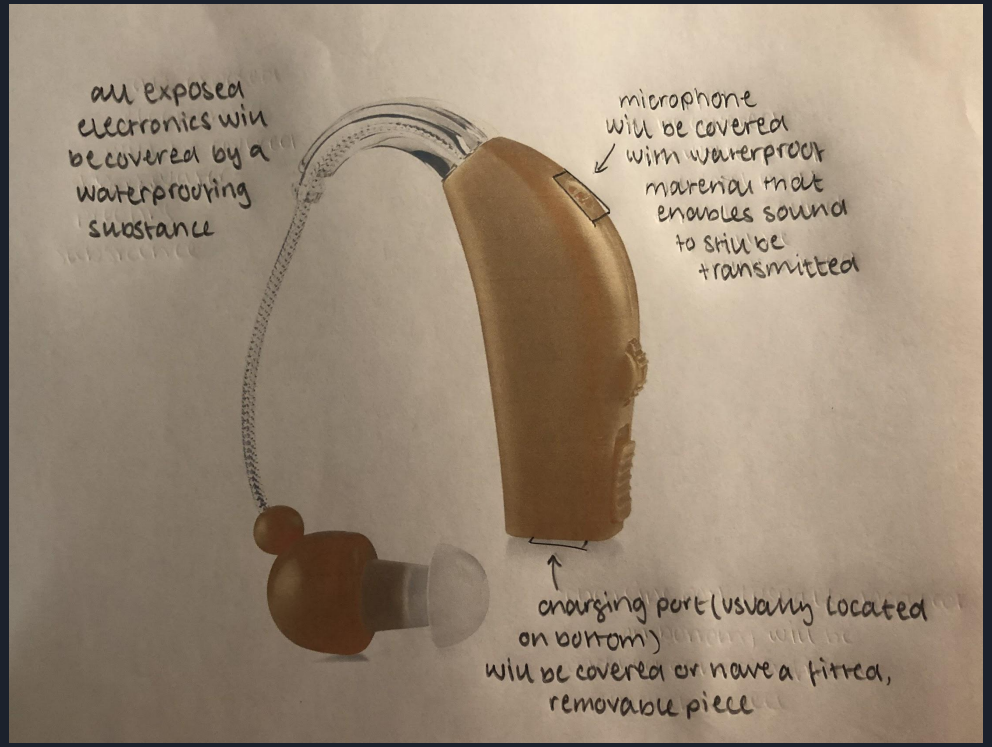
	Metric	Units	Marginal Value	Ideal Value
1	**Cost**	CAD$	100	<100
2	**Water resistance**	IPXX	<IP58	IP68
3	**Weight**	Grams	>150	>145
4	**Battery**	Type	Disposable	Rechargeable
5	**Estimated Battery Life**	Hours	<16	<18
6	**Fit**	BTE or ITE	BTE	BTE

Product Concept

Top 3 choices:

1. Waterproof the electronics with clear nail polish or a hydrophobic spray and make a silicon piece to waterproof the charging port and cover the microphone with a water resistant fabric
2. Take off the original casing of the hearing aid and, using a 3D printer, produce a casing to replace the original
3. Produce a 3D printed case to go over the hearing aid to block off all ports where water can enter and can be removed for charging

Proposed concept



Feasibility study

Is the project technically possible?

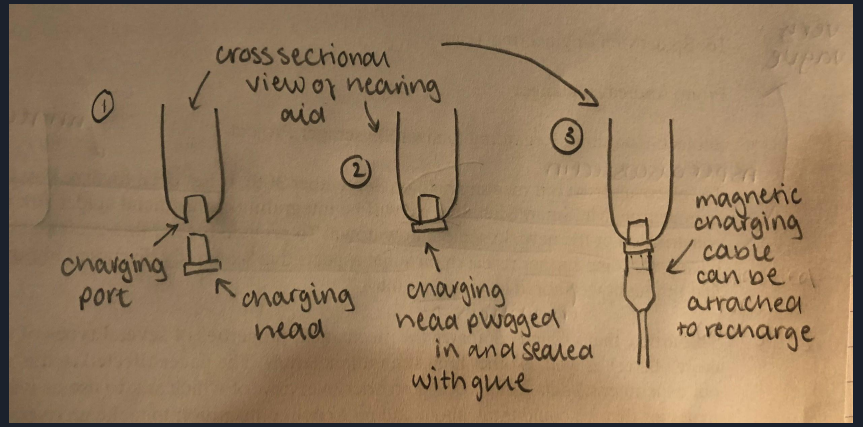
Can the project be afforded?

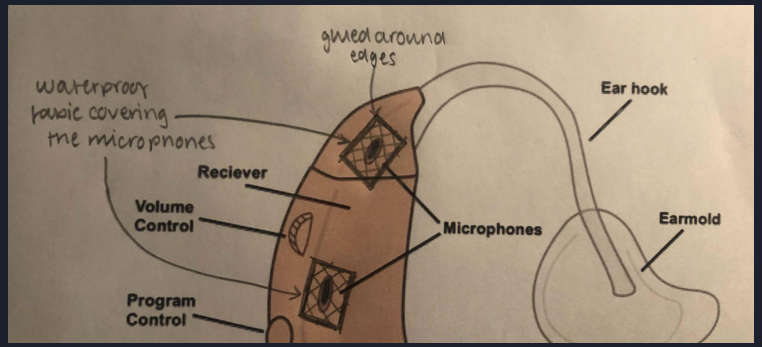
Is the project legal?

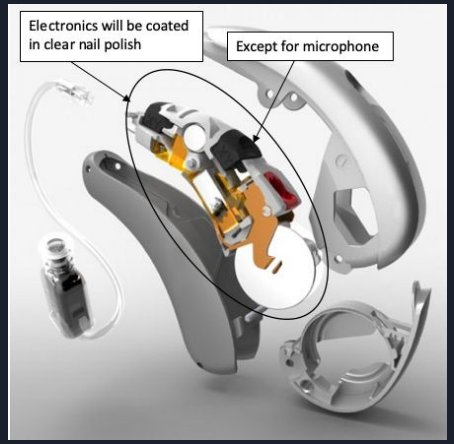
What are the organizational constraints and other factors?

Can the project be done in time?

Prototype Development







Client Feedback

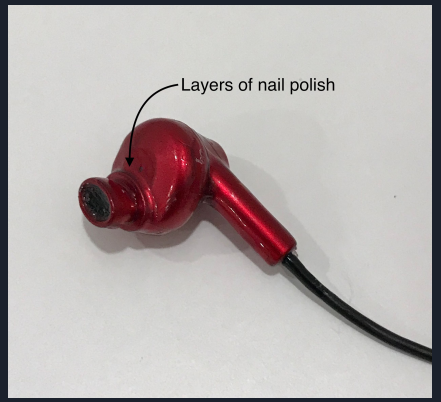
Key points:

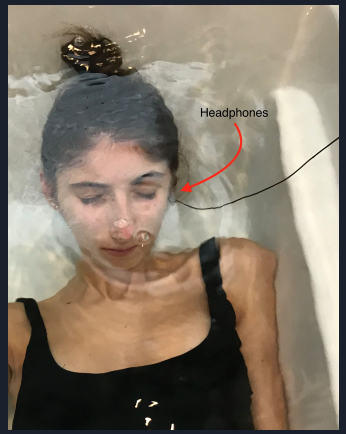
- Batteries expensive, rechargeable better
- Will not wear them for swimming
- Good ideas so far

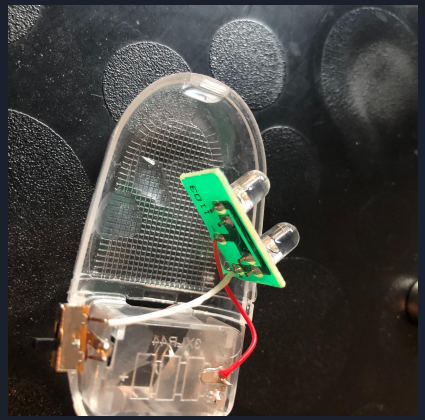
Solutions:

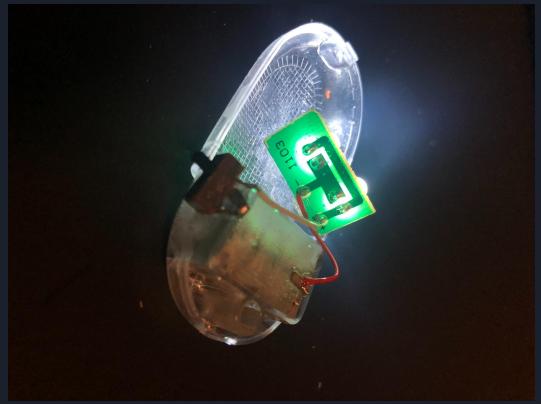
- Keep constructing them as if she were going to wear them to swim
- Maintain progress on rechargeable design, think of more possibilities to make this work

Prototype development and testing



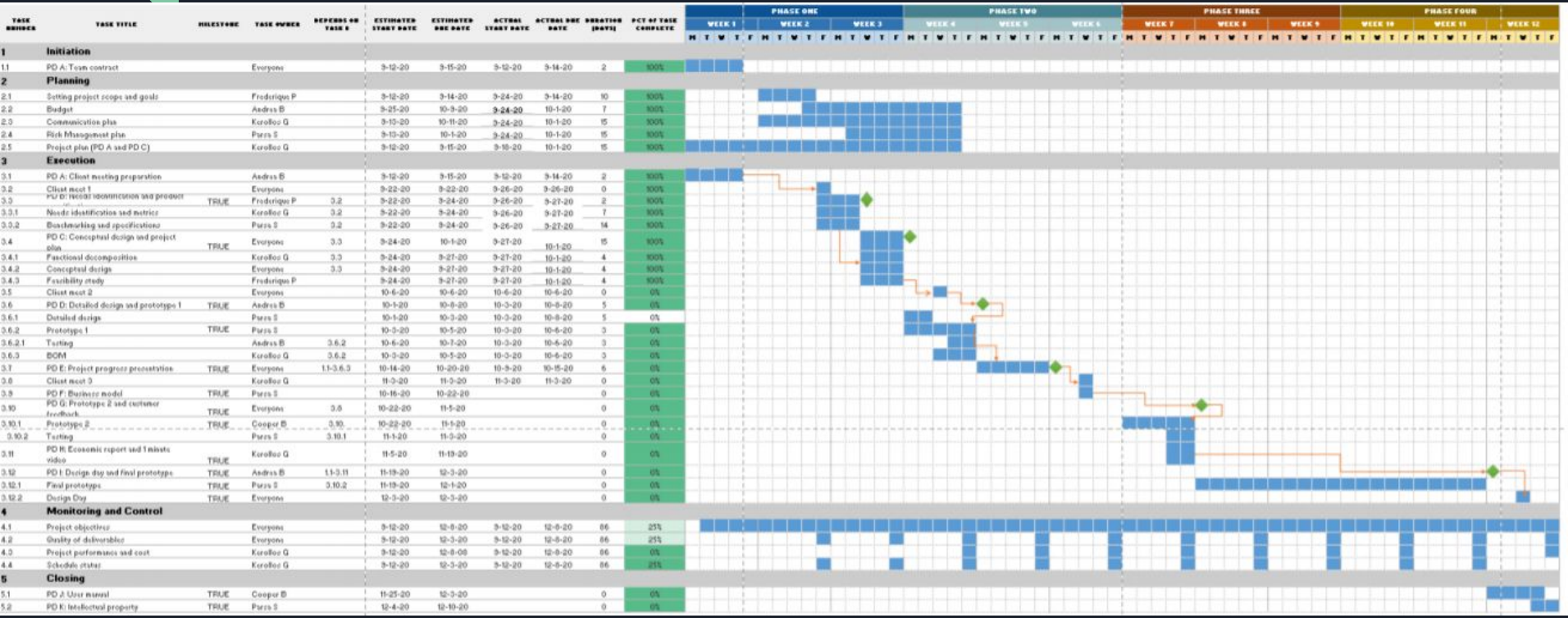






Prototype Development and testing

Project Plan



TASK NUMBER	TASK TITLE	MILESTONE	TASK OWNER	DEPENDS ON TASK #	ESTIMATED START DATE	ESTIMATED END DATE	ACTUAL START DATE	ACTUAL END DATE	DURATION (DAYS)	PCT OF TASK COMPLETE
1	**Initiation**									
1.1	PD A: Team contract		Everyone		9-12-20	9-15-20	9-12-20	9-14-20	2	100%
2	**Planning**									
2.1	Setting project scope and goals		Frederique P		9-12-20	9-14-20	9-24-20	9-14-20	10	100%
2.2	Budget		Andrea B		9-25-20	10-9-20	9-24-20	10-1-20	7	100%
2.3	Communication plan		Karolina G		9-10-20	10-11-20	9-24-20	10-1-20	15	100%
2.4	Risk Management plan		Paris S		9-10-20	10-1-20	9-24-20	10-1-20	15	100%
2.5	Project plan (PD A and PD C)		Karolina G		9-12-20	9-15-20	9-10-20	10-1-20	15	100%
3	**Execution**									
3.1	PD A: Client meeting preparation		Andrea B		9-12-20	9-15-20	9-12-20	9-14-20	2	100%
3.2	Client meet 1		Everyone		9-22-20	9-22-20	9-26-20	9-26-20	0	100%
3.3	PD B: Needs identification and product	TRUE	Frederique P	3.2	9-22-20	9-24-20	9-26-20	9-27-20	2	100%
3.3.1	Needs identification and metrics		Karolina G	3.2	9-22-20	9-24-20	9-26-20	9-27-20	7	100%
3.3.2	Benchmarking and specifications		Paris S	3.2	9-22-20	9-24-20	9-26-20	9-27-20	14	100%
3.4	PD C: Conceptual design and project plan	TRUE	Everyone	3.3	9-24-20	10-1-20	9-27-20	10-1-20	15	100%
3.4.1	Functional decomposition		Karolina G	3.3	9-24-20	9-27-20	9-27-20	10-1-20	4	100%
3.4.2	Conceptual design		Everyone	3.3	9-24-20	9-27-20	9-27-20	10-1-20	4	100%
3.4.3	Feasibility study		Frederique P		9-24-20	9-27-20	9-27-20	10-1-20	4	100%
3.5	Client meet 2		Everyone		10-6-20	10-6-20	10-6-20	10-6-20	0	0%
3.6	PD D: Detailed design and prototype 1	TRUE	Andrea B		10-1-20	10-8-20	10-3-20	10-8-20	5	0%
3.6.1	Detailed design		Paris S		10-1-20	10-3-20	10-3-20	10-8-20	5	0%
3.6.2	Prototype 1	TRUE	Paris S		10-3-20	10-5-20	10-3-20	10-6-20	3	0%
3.6.2.1	Testing		Andrea B	3.6.2	10-6-20	10-7-20	10-3-20	10-6-20	3	0%
3.6.3	BOM		Karolina G	3.6.2	10-3-20	10-5-20	10-3-20	10-6-20	3	0%
3.7	PD E: Project progress presentation	TRUE	Everyone	1.1-3.6.3	10-14-20	10-20-20	10-9-20	10-15-20	6	0%
3.8	Client meet 3		Karolina G		11-3-20	11-3-20	11-3-20	11-3-20	0	0%
3.9	PD F: Business model	TRUE	Paris S		10-16-20	10-22-20			0	0%
3.10	PD G: Prototype 2 and customer feedback	TRUE	Everyone	3.8	10-22-20	11-5-20			0	0%
3.10.1	Prototype 2	TRUE	Cooper B	3.10	10-22-20	11-1-20			0	0%
3.10.2	Testing		Paris S	3.10.1	11-1-20	11-3-20			0	0%
3.11	PD H: Economic report and 1 minute video	TRUE	Karolina G		11-5-20	11-13-20			0	0%
3.12	PD I: Design day and final prototype	TRUE	Andrea B	1.1-3.11	11-19-20	12-3-20			0	0%
3.12.1	Final prototype	TRUE	Paris S	3.10.2	11-19-20	12-1-20			0	0%
3.12.2	Design Day	TRUE	Everyone		12-3-20	12-3-20			0	0%
4	**Monitoring and Control**									
4.1	Project objectives		Everyone		9-12-20	12-8-20	9-12-20	12-8-20	86	25%
4.2	Quality of deliverables		Everyone		9-12-20	12-3-20	9-12-20	12-8-20	86	25%
4.3	Project performance and cost		Karolina G		9-12-20	12-8-06	9-12-20	12-8-20	86	0%
4.4	Schedule status		Karolina G		9-12-20	12-3-20	9-12-20	12-8-20	86	25%
5	**Closing**									
5.1	PD J: User manual	TRUE	Cooper B		11-25-20	12-3-20			0	0%
5.2	PD K: Intellectual property	TRUE	Paris S		12-4-20	12-10-20			0	0%

Next steps

- Purchase hearing aid
- Assemble prototype
- Test for waterproofing

Thank you for your time!