electrolite

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timeline overview

Week 1

Design challenge ideation & background research

Week 3

Research into what festival habits potential users had around water and daily events

Week 4

Finalised design challenge & storyboard creation

Week 5

Researching materials & low fi prototype creation to test / iterate upon

Week 7

User testing for festivals and methods of carrying the bottle

Week 8

Festival research showed no reason for bottle so pivot to everyday

Week 9

Development of a medium fidelity prototype to test with

Week 10

User testing for the context of everyday life and testing a higher fidelity prototype

Week 11

Finalisation of concept and components and construction of housing

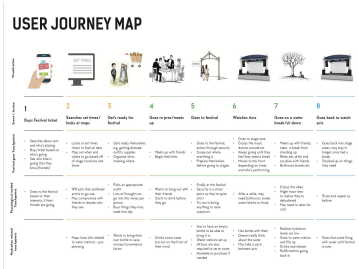
Week 12

Development of final high fidelity prototype prototype

timeline diagram

Background Research

We researched problems and products associated with dehydration at music festivals. We looked into physical and digital products like smart bottles and apps



Concept Development

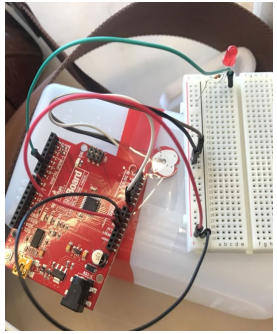
3 concepts developed & evaluated using Pugh decision matrix.
Decided upon final concept which was a smart bottle for festivals as this was technically feasible and a good solution to problem

User Research Stage One

Interviews, questionnaire & focus groups conducted to understand the problem. Key themes were found through affinity diagramming. This along with background research allowed us to ideate and come up 3 concepts which we explored further

Low Fidelity Prototype

Different bags, bottles and sensors were tested to understand the user experience at music festivals and what was the best way to solve their problems



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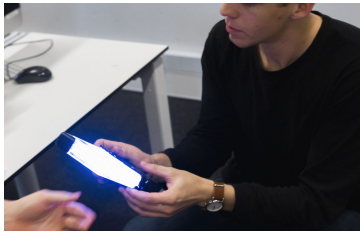
Pivot

After user testing we found issues with the context and decided to change to millennials looking to take charge of their health

User Testing Round Two

After changing context we tested our prototypes with users and found several things to change (EG), but mostly fit into the context of everyday life of millennials

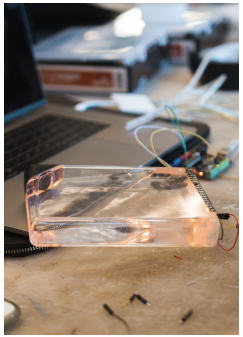


User Testing Round One

Tested low fidelity prototypes with users. Found flaws within the framework of our context

Medium Fidelity

Created 2 medium fidelity prototypes with the temp sensor in one and the heart rate monitor. Two different light settings were implemented to be tested in user testing



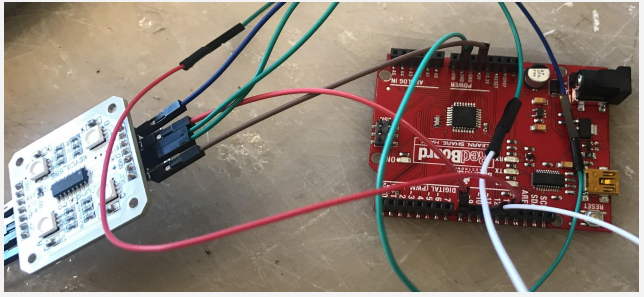
High Fidelity

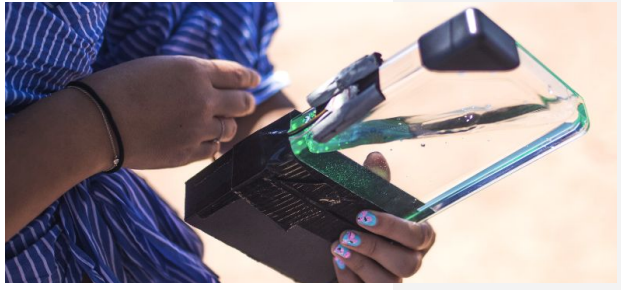
3D printed bottom of bottle for the components. Purchased a more responsive heart rate monitor in response to problems encountered in user testing.

Process Evaluation

We used a range of design methods with varying intentions. We developed our user testing protocols from the first iteration and were able to implement improvements in our data collection method and running of the tests.

We needed to design for the user, not what we wanted to design which is what lead us to pivot to a different context throughout our prototyping process.





Effectiveness of Design Methods

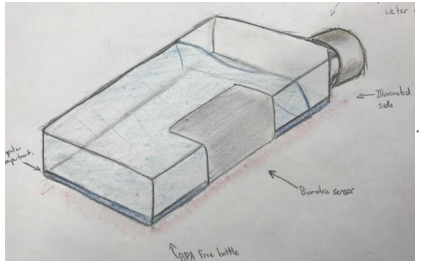
Overall our choice of method was good and informed. We saw strong improvement by iterating our product in a number of phases; but throughout the process our research, testing, build and documentation was throughout and gave us direction.

Resolution of Conflict / Issues

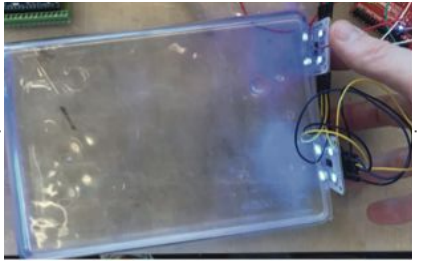
We felt conflicted about the festival idea after our first round of user testing. We had worked to design a product that could fit the context but users seemed to want something else or nothing at all. We spent time researching and found resolution by pivoting to the context of everyday.

From our user testing we drew a range of comments and suggested improvements from users. Things like purple being a confusing colour for feedback. Users wanted something to explain feedback signals, or it to be directly understandable. Users also felt the bottle was almost too bright when drinking as the LED shon directly into the eyes so it was dimmed and the placement of sensor on the bottle was directly gauged from looking at photos of users during testing holding the bottles.

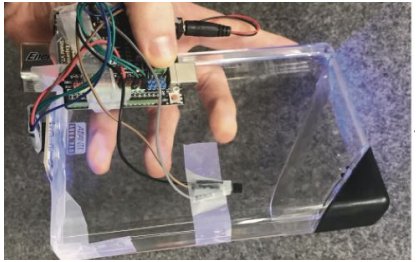
design documentation



Initial concept sketch of what we saw our bottle eventually developing into, and the placement of sensor inputs

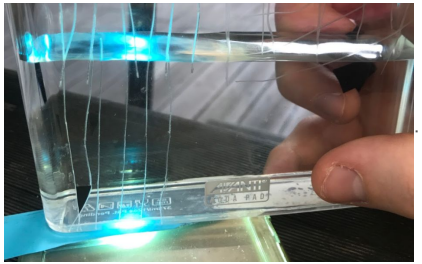


After experimenting with **shiftbrite lights** we realised we had to shift our expectations to do with the compactness of our electronics

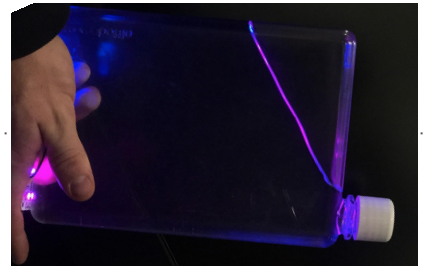


Experimenting with different light colours and water moving inside the bottle. Used **arduino uno**

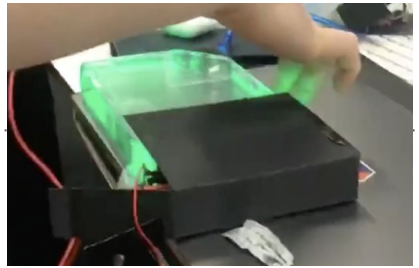
Prototyping placements of sensors. Had to play around with what was comfortable for users



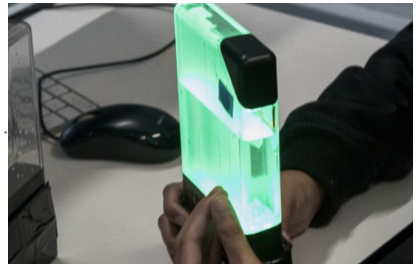
Experimenting with etching to diffuse the light and allow it to be seen in different settings



New **neopixel** lights and experimenting in different lighting conditions

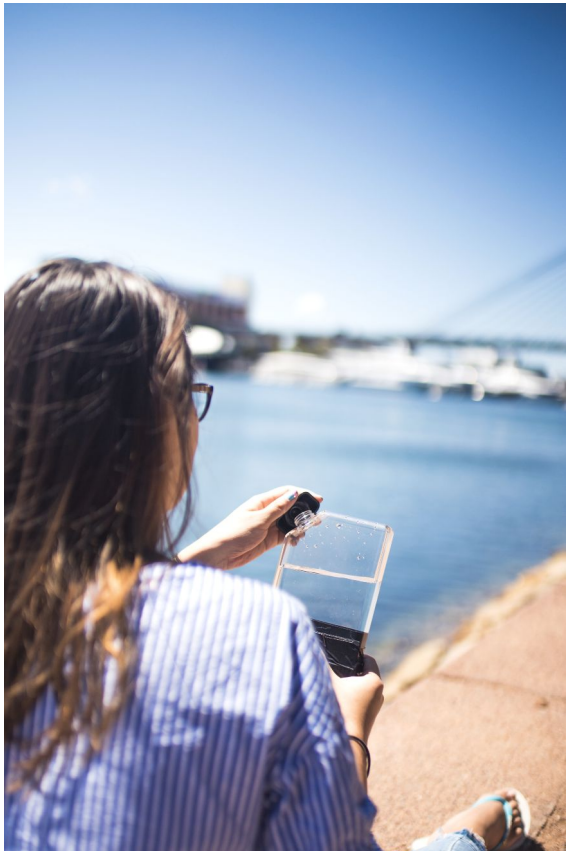


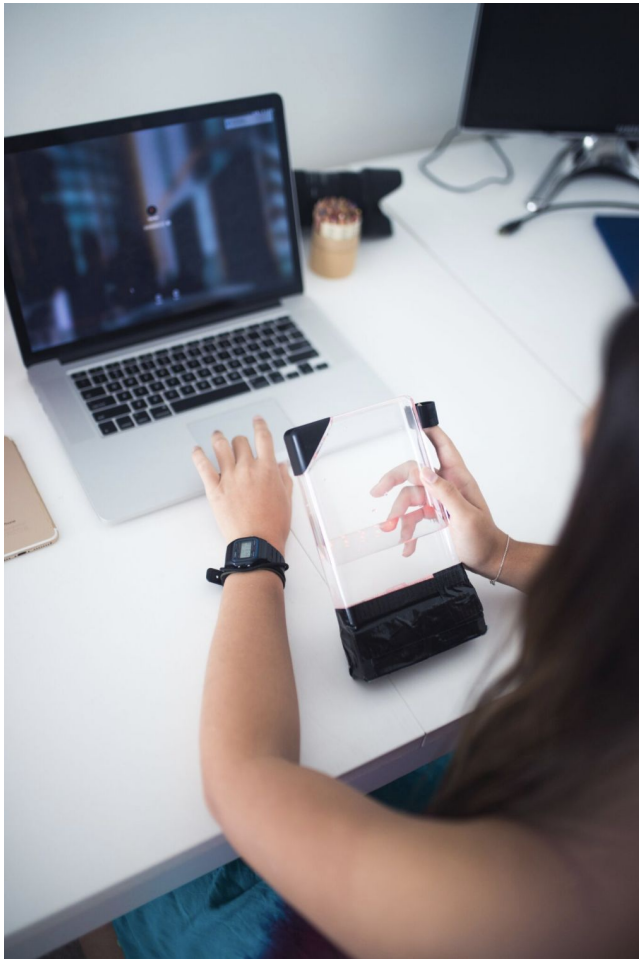
New lights colours and **amped pulse rate sensor** included



Light and sensor placement finalised, **arduino nano** included

Final Product



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electrolite instruction manual

how do i use it?

1. When you hold the bottle the sensors will read your current temperature and heart rate

2. It then calculates if you are potentially dehydrated and will flash/glow to indicate if you should have a drink.

3. A red glow means you need a drink, green means youre fine and purple means the bottle is still reading your vitals.

Final Product

Our final product has iterated a number of times but has met the criteria we have set for each period and context researched.

The final bottle implements a heart and temperature sensor that works almost instantly after a user picks up the bottle. Loading and indication to user of the process was iteratively added.

Our feedback led us to stick to the use of red and green as other colours didn't make immediate sense to users; but red and green are universal and instantly understood.

Our product takes this feedback, minimises the size of the bottle and silicones the bottle to make it waterproof and protect the electronics from shorting to protect the user.

Next Steps

To take the product to market we would have to make the following considerations. We would need to figure out how to design the electrical components in a way that doesn't rely on an arduino. This would improve battery efficiency and allow us to further miniaturise the bottle. We would also need to develop a marketing strategy and find adequate funding to reach production. Implementation of highly experimental dehydration sensors being developed at Berkeley University in the United States would greatly increase the degree of accuracy and would reduce the need for a heart and temperature sensor and would further reduce the bottles electrical componentry.