National Design Project

Team Aspiration

Adli, Ziqi, Jagan, Rayyan, Rafly

Our problem

Problem: We want to investigate the reason why people don't cycle as a form of exercise.

We would like to know more about why people won't cycle, especially if they had the chance to do it (riding to work/school, exercise etc) so we have decided to put in a reward system of people using bicycles in exchange for electricity for their electronic devices

So, why is it important to solve this problem?

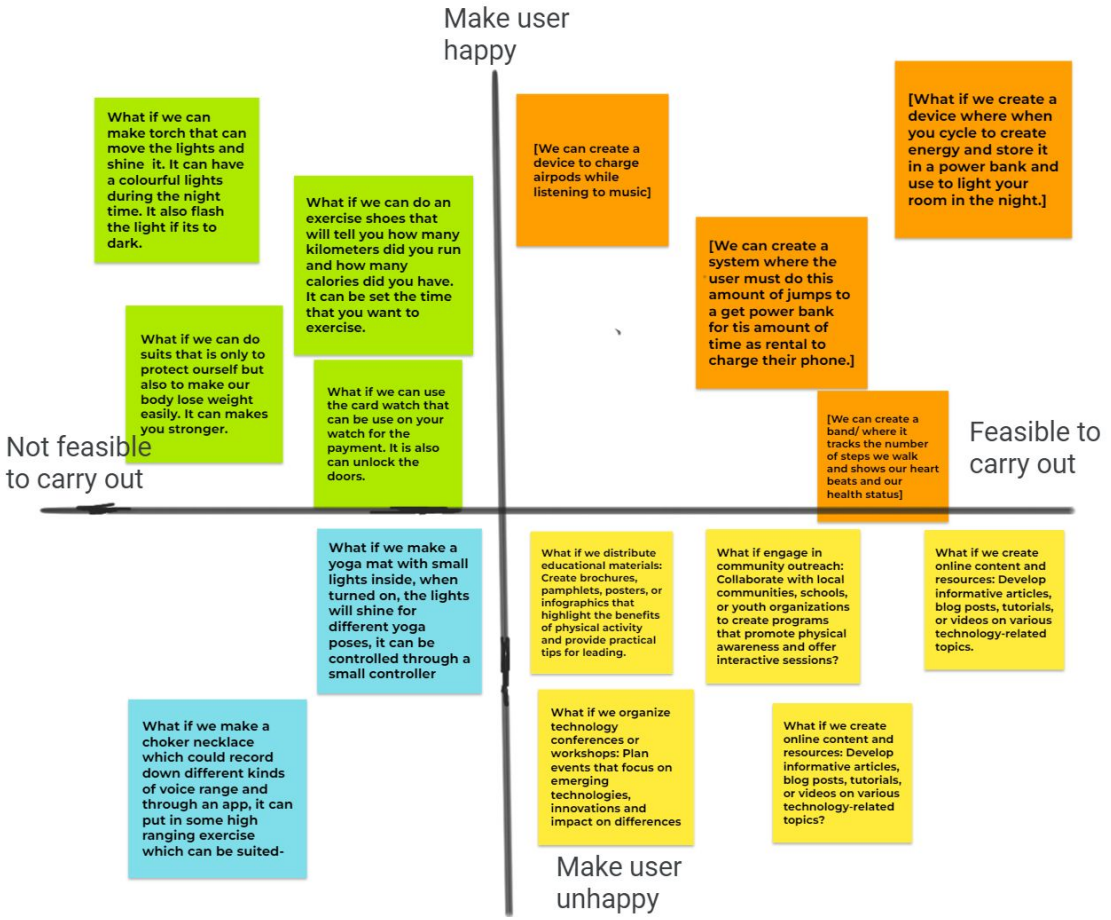
It is important to solve this problem as it promotes healthy lifestyle through cycling and how it can also provide for the environment to make it better

Our solution

The solution is to find ways to motivate people to exercise. We suggest to have a device that allow them to cycle and charge their power bank at the same time as a form of motivation. Then, they can use the powerbank to charge their devices however they want. Not only that, we want to investigate on how we can put in reusable batteries inside as a function, so that it could be use as an energy source for radios, torch lights as such.

Our Methodology

- Did a rapid brainstorming session to think what might be the best solution that is feasible to carry out and will let our user happy
- Our team decided to design a charging mechanism that helps user to charge power bank while cycling. We hope that this will encourage users to cycle more.
- To confirm our hypothesis, we conducted an interview, about 7 to 8 people per age group.



(The Interview Report)

How the interview went:

It when smoothly and many people were very cooperative and answered the question truthly as we know.

Questions for the interview

1.Would you like a bicycle with a portable power bank? Why or why not?

2. Do you think that you would cycle more with a portable power bank?

3. Do you think it’s wise to have such a function for a bicycle?

4. If there is such a bicycle, would you have one?

Result Data:

People of different ages	Respons	How much they want the product
Children (9-12)	They will agree in this prototype as it will be good for their powerbanks to charge	More would like the product
Teens (13-14)	They might agree with this prototype as it helps their fitness and powerbanks	Most would like the product
Adults (18+)	They might not agree with this as they may thnk is to expensive and unsafe	50/50

What we conclude from our interview:

a. **Different preferences from different age group:**

- most teens and children would prefer the product more than the adults
- the adults believe that it might be unsafe as it could result in an accident.
- As for the other age groups, they believe that it brings them convenience instead and it could really help them especially to those who don’t charge their phones overnight

What we conclude from our interview:

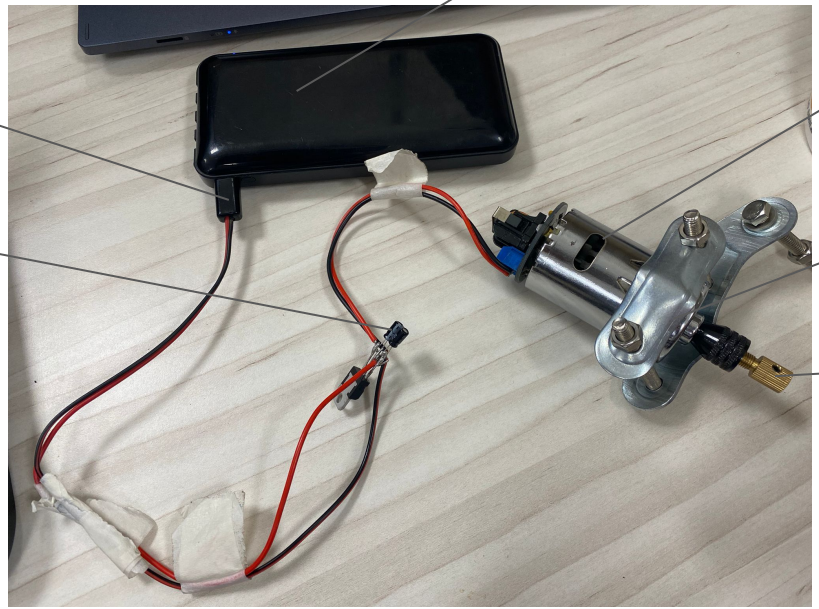
b. Problem with the proposed solution:

- User will pay attention to the phone while cycling and can cause an accident if they are not focused or paying attention to their path which can hurt someone or harm someone in the process.
- The prototype would need a slight or large amount of energy to generate to use the powerbank to charge mobile devices.

Solution with the prototype:

It uses the battery to charge the powerbank whilst cycling which then can be used to charge mobile devices which is helpful incase one would want a fully charged phone when they arrive at an area or a place.

The Prototype



The Prototype

How it works:

- The shaft turns when the bicycle tyre turns.
- The kinetic energy from the motor is converted into the electrical energy generated by the motor.
- The capacitor make sures the power bank receives the appropriate amount of voltage to start charging the power bank

The Prototype

- We also explored different positions to mount the bracket with the device so that the bicycle is stable

- Unfortunately, our team was unable to test with the mounting the device due to insufficient timing.

Conclusion

- We have learnt a lot on the experience on things we need to consider during the entire design process
- The details to think about was beyond what we initially thought that is needed
- It was a good learning experience for us