Assignment-2

21BCE10072
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VIDEO GAME CONTROLLERS :—

Background :-

Video games are a worldwide phenomenon. There are over 31 million gamers in the UK, and in 2019, the industry reached a total market value of £152.1 billion. Gaming is a cornerstone of culture, offering a form of entertainment for everyone, regardless of age, gender or race.

① Identify and Define problem :—

User Requirements :—

① Final product should be able to adapt for different users
② The final product should take the form of a standard controller.
③ At a minimum, the main inputs of a standard controller should be accessible
④ Assembly and modification of the final product should be possible with one hand.

② Gather information :—

first I considered attachments for existing controllers. Perhaps they could extend the reach of the handles, or provide a proper testing surface so that users can hold them in a different way. Selling add-ons would be much more enticing approach financially as well.

① Current controllers all have static components on the PCB such as soldered connections and touch sensors.

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② for a mechanism that fits over top of the controller, it would be too mechanically complex, cumbersome and may get in the way of other inputs.

③ Identify possible solution :—

Continuing with the idea of modularity, the next step was to figure out the easiest way to take the controller apart so that a user may adjust the physical layout.

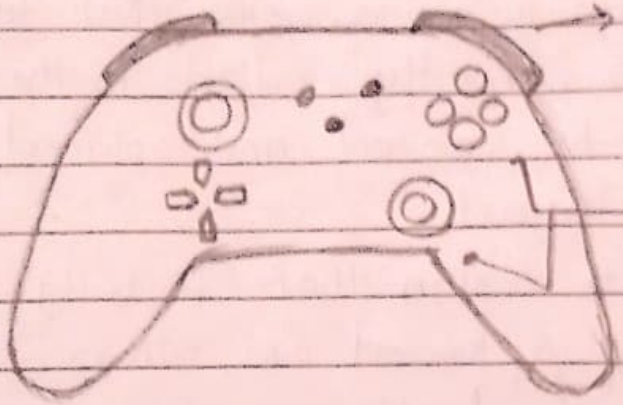
Plastic shell

I considered two ways to secure the controller. The first would have involve some kind of plastic chips mechanism akin to what is already being used. I did not want to pursue this option because as previously mentioned, it can be quite difficult to pry part, & that would not be suitable to my one-handed assembly requirements

PCB

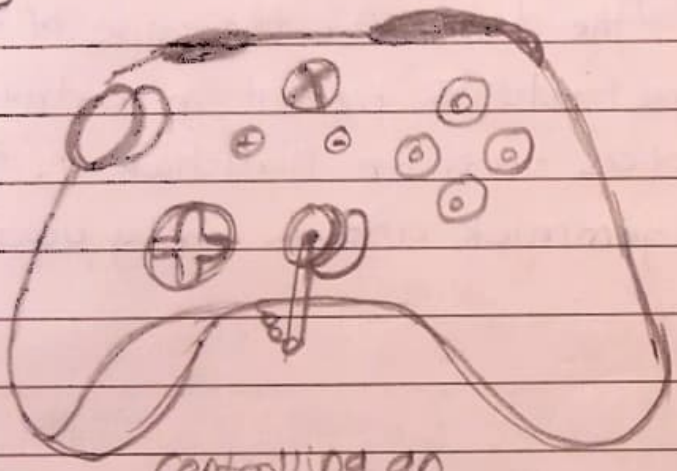
Current gamepads have a variety of internal designs I thought about making the PCB modular. This would allowing the user to re-use the components of a controller without a laborious disassembly process.

④ Prototyping :- (mainly sketching)

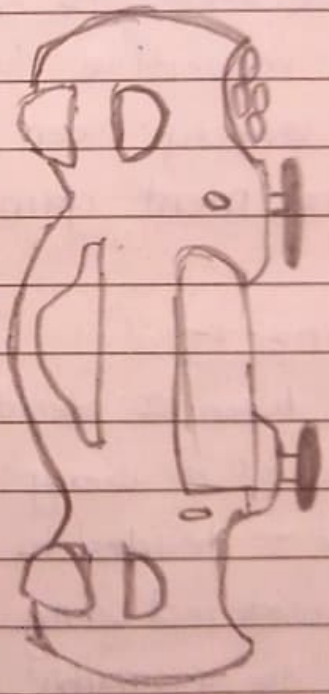


Front view

moving inputs to rear via Add-on



Controlling an analog stick at a distance?



would be tough to get mechanism around curvature

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(5) evaluate or test :-

The final design is a video game that takes place the shape of standard gamepads currently available in the market. The top & bottom faceplate can be removed and replaced with faceplates that feature a different layout.

The first PCB design that I fully explored was the use of low profile spring-loaded pins, otherwise known as "Pogo pins". This was considered after searching how MagSafe connections work. plus the magnetic snap fit of the MagSafe makes it easy for one handed assembly.

To simplify the design for the scope of the project, I decided to omit some features present in controllers, Namely the capacitive touch pad as seen on Dualshock 4. The touchpad is largely seen as a gimmick and is rarely used in moment to moment gameplay.

(6) Refine :-

When I decided to change from the pogo grid setup, I had to think of a way to attach each input component to the faceplate Befor I decided to attach the inputs to the faceplate themselves, I considered using another magnetic connection. This would be incredibly easy to assemble,

Then I noticed that the box for one of my controllers had a prefect packaging mould. So I designed the packaging to be able to hold onto the controller so users can confidently take apart their controller without any assistance. Now that the user can access all of the inputs with their left hand, they can enjoy video games to the best of their ability.

(7) Communicate:-

The detailed design must often go through some sort of design review or approval process before it can be implemented. A design review can come in many forms. Some review occurs a simple conversation between two of designers. Some review are done as a meeting of the design group where they recap and check the work that has been completed and try to find errors.

I was unable to interview potential users in person. However, I reached out to an online forum for disabled gamers and interviewed three individuals with varying disabilities. We spoke about that what hardware and software solutions they have tried, what kind of games they played, and what they would like to see in an 'ideal' controller.

controller.

Cost analysis:-

Sr no.	Part/Component	Price
1]	Plastic Housing	Rs 300 /-
2]	Triggers, D-pad	Rs 150 /-
3]	Rubber Gaskets	Rs 100 /-
4]	Plastic contact Board	Rs 500 /-
5]	Speaker	Rs 250 /-
6]	circuit board	Rs 900 /-
7]	analog joystics	Rs 150 /-
8]	~~Batte~~ Battery	Rs 300 /-
9]	Vibration motors	Rs 250 /-
		Rs 3000