Design Think Template

1 - Interview:
Interview Scribing

Questions asked:

How do you currently perform the task of VR swordplay
How can you tell when you are succeeding while performing that task
Are you satisfied with your current method of performing the task
What is the most frustrating thing about this method
Without this solution how would your life differ
Can you think of any improvements to the current solution/method

Expert Interview 1:

1. Holds the controller either forward or sideways, finds it more comfortable, and allows for easier movement for VR. Finds that in Beat Saber the controller is treated as more of an extension of your hand rather than being something you wield.
2. If holding the controller feels comfortable and you can swing easily then it becomes easier to succeed. As long as your wrist isn't restricted you're good.
3. "I mean, yes. It works but I think it could be better" If something was designed specifically for these games it would be a lot better.
4. The controller being comfortable, it's left marks or small injuries on their hands in the past, although their current method may be a more comfortable way to perform the task than the default method, it is still uncomfortable at times.
5. Would attempt to find any other solution ex. Different headset/controllers. Without things on the market to allow the preferred solution, they wouldn't perform as competitively and potentially stop playing altogether. This could lead to gathering like-minded individuals to create a new form of solution together.
6. A slimmed-down and very lightweight version of the existing controller design, with improved weight distribution.

Expert Interview 2:

1. Controller, wrist, and arm heavy approach. The Center of mass should be centered in the palm of your hand. This allows for ease of movement and increased stability.
2. Looking at your in-game (referencing Beat Saber) accuracy will show if you're hitting a note and how precisely you hit it. Users can't fully trust this at all times as you can perform inaccurately while still being awarded full points.
3. Yes. The method has improved significantly and cannot be refuted from their experience. There may be a better way but such a way has not been found/presented to them.
4. The complexity is frustrating, for someone new the VR alterations like grip and controller settings can be very confusing. Even with existing mods and other resources, due to

how all players experience things slightly differently it's a complex process for someone to find their perfect fit. There are also no existing extensions or applications designed to allow players to practice their swing techniques for individual pieces of swordplay ex. Perfecting one specific swing/motion.

5. Coaching would be stopped, and videos would no longer be produced. The level of outreach attained would never have happened and it would incite a full change of occupation. Could affect those who were using different controllers previously in different ways. Without the current solutions, they would've likely stopped playing after a short while.
6. Complete controller redesign. Specifically designed to have no tension on the hand, which would include the removal of the wrist strap to remove tension on the wrist and a new way to hold the controller that is designed for a user to have outstretched fingers to allow more movement. The Center of mass on this controller would be positioned in the palm of the hand, and the default or intended way of holding the controller should apply to all users.

2 - Dig Deeper:
Infrequent User Interview 3:

1. With the Oculus Touch Controllers.
2. Visually they can see if they are performing well, "if I see that the sword is low, I will raise it." Without the physical weight of a sword in their hand, they cannot feel any actual difference to dictate sword position.
3. "I tire easily, which may not be a problem for all users, but is part of how some people use VR." Finds most VR applications to include a high degree of physical activity. If the sword becomes heavier they may find themselves tiring even faster than usual. If the game was designed only with fun in mind, then not having the extra weight to allow for longer play sessions would be better, but if the application is experience/realism focused they would prefer having the heavier sword even if it means they would have shorter play sessions.
4. The existing wrist straps tend to loosen after time spent swinging which can lead to the controller leaving a user's hand if swung hard enough.
5. Does not use an "alternative solution" outside of the default/intended way to hold OculusTouch Controllers, Removing the ability to use this solution removes the controllers themselves inevitably leading to an inability to play any virtual reality applications.
6. Finds velcro straps would be significantly better at holding the controller to the user's hand, specifically intends this solution to be a replacement for the existing controller's wrist straps.

Infrequent User Interview 4

1. Finds there is not enough weight, would use two gripped controllers, fictional and fake feeling since you can flail your wrist around to swing which cannot be done effectively with a real sword.
2. Hitting notes or defeating enemies provides visuals and audio from the game grants auditory as two in-game forms of feedback. Success is only able to be determined according to the game and the physical ways of knowing you are succeeding are limited.
3. It achieves its purpose, and the current state of the solution is still satisfying to use despite the lack of accurate weight or external feedback from the real world. Adding weight could add realism and immersion to the overall experience.
4. The current solution does feel comfortable, finds that a physical peripheral grants more control and feels better to have a physical extension to the controller. The weight would add immersion. “Throwing an ax and throwing a knife feel the same”
5. Without the current controllers, they believe it would be a return to the Xbox Kinect style of hand detection which they find to be far worse and would make what is done with today's controllers near unattainable. The controllers are what grant users the actual ability to feel as if they are performing the actions. Removing the controllers removes the player from being able to exist properly within their virtual environment.
6. Available space could become an issue. Weighted wrist straps that can move and become heavier, but the controllers themselves are essential to keep and are what allows the experience to flow smoothly. Extension sword peripheral attached to the existing controller with an additional form of feedback to allow you to feel closer to the experience. Vibration could potentially be the extra form of feedback.

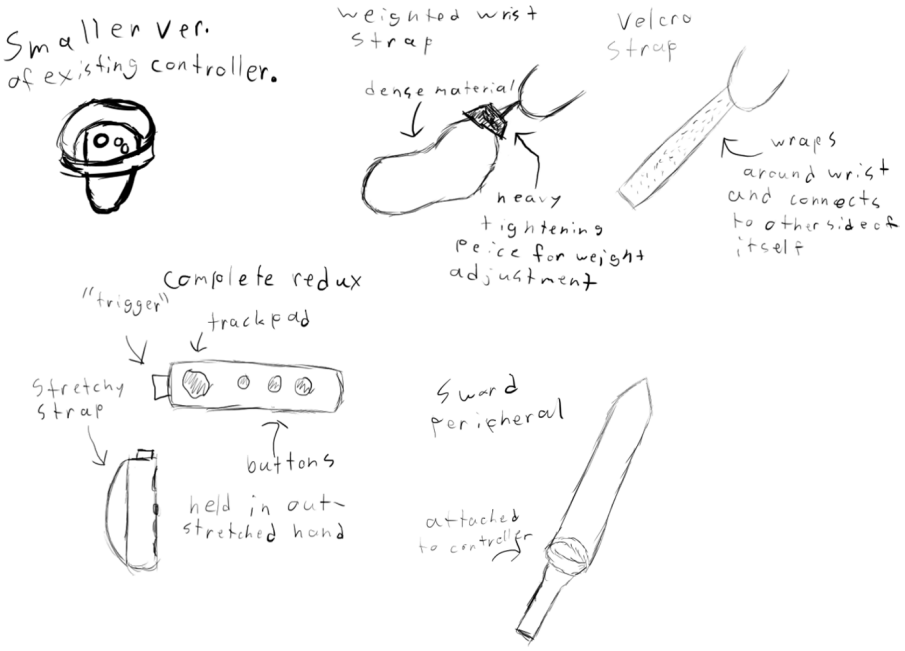
3 - Capture Findings:

Virtual Reality users are looking for ways to increase their immersion experience. They want to be able to feel better control over the sword they wield, while still maintaining comfort and freedom to move. Users lack a sense of real-world, passive feedback when in the virtual space. Some users would prefer to have increased realism even if it means having shorter play sessions.

4 - Take A Stand With A Point Of View

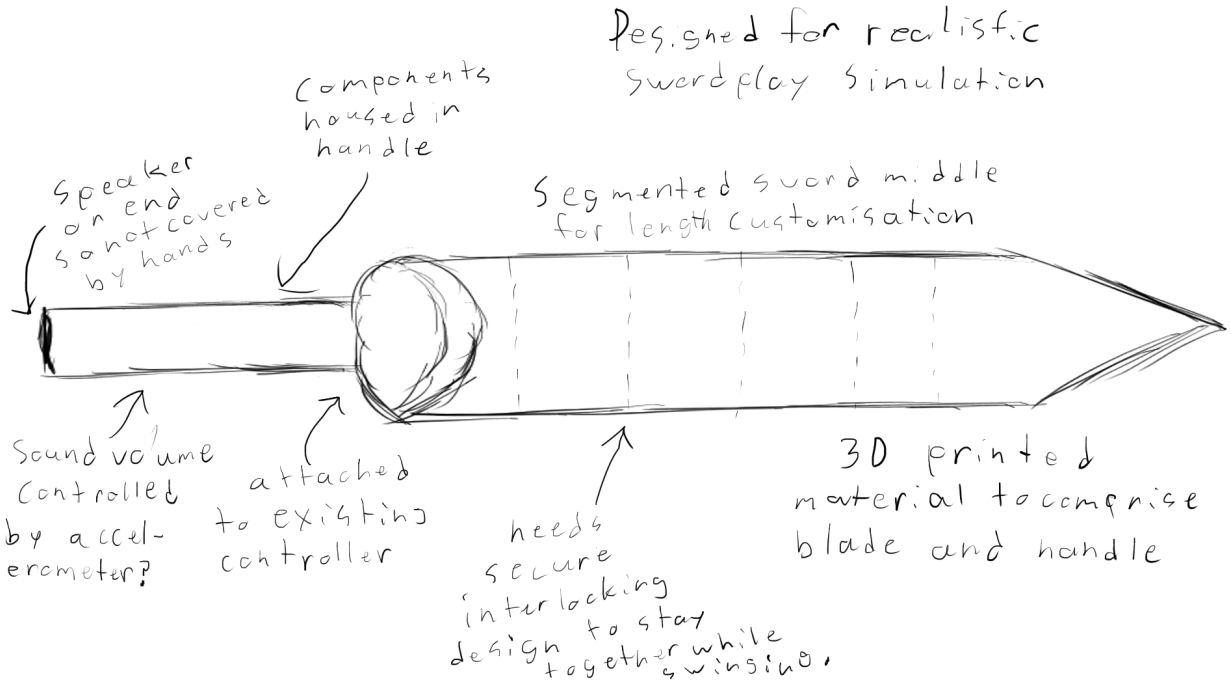
Virtual reality users need a way to perform virtual reality swordplay that is more realistic but also utilizes real-world passive feedback to help better connect the real and virtual worlds during their experiences.

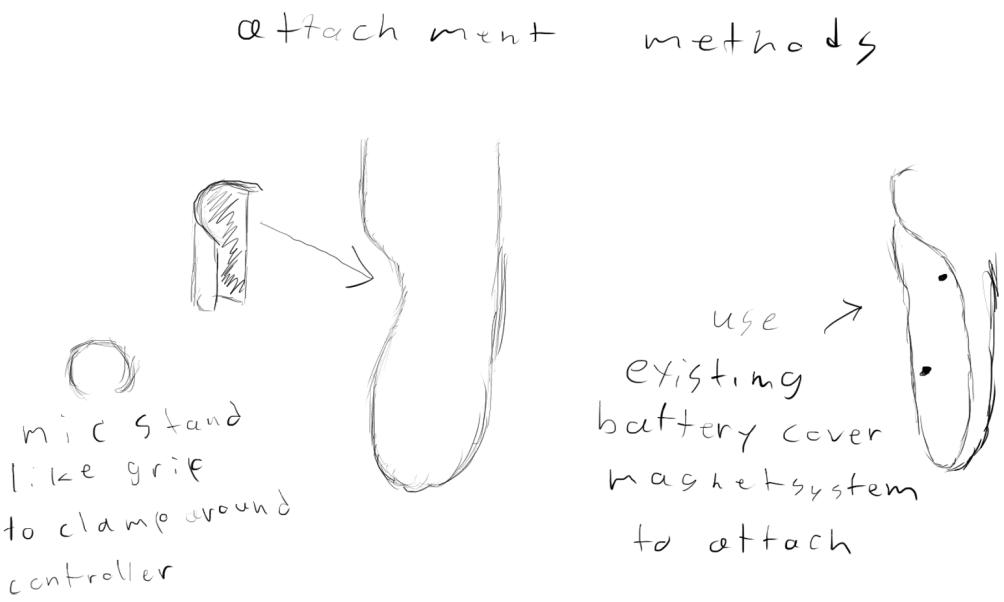
5 - Sketch 5 Potential Solutions



Recreating the entire controller structure is infeasible, and wrist strap modification is simpler. The peripheral would give the most accurately positioned weight distribution. Weighted straps may cause pain on the wrist if the weight is too high.

7 - Generate New Solution





System Architecture