GNG 2101 – Project Deliverable C: Conceptual Design

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Problem Statement

The client (name classified) needs a way to type comfortably using a stick in his mouth without long term neck and spinal issues.

Product Benchmarking:

There were many different ideas for laptop stands that could address the needs of the client. However, the two main ones that look the most beneficial are the Fellowes Laptop Riser and the Merangue Mesh Laptop Riser.

Fellowes Designer Suites Laptop Riser:

Since a laptop stand in this case is supposed to relieve neck pressure and prevent long term neck issues, a change in angle could be highly beneficial. According to the client, adjusting the angle could also solve comfort issues. An example of this would be the Fellowes Laptop Stand. This stand has an angle range from 0 to 30 degrees. It can support any 17'' or lower sized laptops. It has a maximum weight capacity of 25lbs. The front edge also stabilizes the laptop.

The benefits of this stand would be the capability to support a wide range of laptops and stabilize them. However, the negatives include the low range in angle change. A stand that can go from 0 to 45 degrees would be better and more suited for our client since he likes his table at a lower height. This stand also caters towards people who can adjust the angle with their hands. A good laptop stand would be able to adjust the angle with his stick.

Another laptop stand that addresses his angle issue is the Merangue Mesh Laptop stand. This stand has another additional feature of air ventilation and is lighter. There is an adjustable height that has 4 different already installed levels. It can go up to 45 degrees and the 4 different heights are 0, 15, 30, and 45 degrees. The benefits of this stand is the wide range of angles and the ventilation. Since the clients laptop is relatively old and needs a cooling pad, a good ventilation would be really helpful to keep his laptop functional. However, the negatives of this laptop stand are that it caters towards people who are on the go. The stand is made to be light and has a feature to be sat on a lap.

The fragility of the stand might make it break when it is holding a heavy laptop and a cooling pad. The stand also does not adjust for laptops with higher dimensions. A laptop with ventilation, good angle adjustments, and durability would be ideal. The stand should also be able to adjust with him using a stick.

Target Metrics

The clients laptop measures 22.7cm long, 33cm wide, and 2.4cm tall but should be able to hold the maximum sided laptop of 36.6cm wide, 23cm long, and 3cm tall in case of laptop replacement. The temperature of the laptop must stay below a temperature that will cause the laptop to overheat. This means that the laptop's central processing unit must remain under 90 degrees Celsius. Finally the laptop holder should be able to adjust the laptop to an angle of 45 degrees.
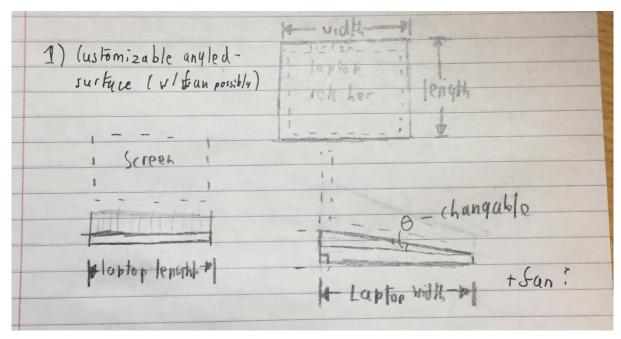
Association of client needs with product metrics

The most important metrics to operate the design of the product are the device's dimensions. In terms of its base, the length and width of the product must accommodate the area of the laptop. The rest sitting at the top of the new product should outstretch the length and width of the laptop by several a little over an inch at least. The client's own laptop measures 22.7 cm by 33 cm, with a height of 2 cm. Making the product with base dimensions 24 cm by 35 cm would be a sensible allocation for our client's needs.

The mass of the laptop should also be accommodated by the product, particularly given that it is a somewhat old and bulky model. Thus, the device should be made from a somewhat strong material, capable of holding half a kilogram or so. It would be wise to obtain the laptop weight during our next meeting for this reason.

Product Sketching

In response to the client meeting, our group has devised an early outline for the overall product. The following is one of these such sketches. It is still very basic, with several details yet to be worked out. It is, however, a rough start to the final product we aim to deliver.

Client Meeting Reflections

The client meeting was very beneficial in learning about how the client currently uses his laptop. A key point was looking at the stick and learning that it had a little bit of an indent. It was also beneficial to see what goes in his mouth when he is typing. One thing that we realized after the meet was that the client would not really prefer any other setup, this was easily displayed by how quick he was typing and how familiar he was with the shortcuts.

We also learned what the client's main use case is with his computer. Surprisingly, the client is an avid gamer, which highlights even more why he doesn't use other solutions like speech to text, eyetracking, or an onscreen keyboard. We also learned that the client can usually use his laptop for hours. We also noticed that the trackpad isn't used, he uses the numpad to move around his cursor. There are many shortcuts mapped to the function keys on his laptop that allow him to navigate more easily.

The client was satisfied with his current setup and was only looking to reduce the possible neck pain. The client has two differently sized sticks that rest on his laptop and he uses the larger one for typing and the smaller one was for backup. The client's also has an external webcam, a laptop cooler, and an external mic. The client was very keen on not changing his setup too much but was looking to improve the angle of the laptop. The client also has some snacks and a drink at his desk and needs to put down his stick to eat or drink.