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# THE HOLODESK

## PROJECT PROPOSAL

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### Abstract

In the current state of workspace design, there exists a very strong border between our “soft” things and our “hard” things. That is, everything on a computer exists in a completely separate space from our papers and books, and therefore using the two concurrently can become quite cumbersome. The commercialization and widespread use of the table went a long way towards easing this dichotomy between the soft and the hard, but it hasn't quite gone far enough. The Holodesk is a response to this observed problem.

### Who We Are

We are a group of students looking to craft an immersive and interactive workspace and learning experience by using gesture control and holographic projection technology. Our group has combined experience in 3D modeling, bio mechatronics, software engineering, machine learning, business administration, business law, marketing, and live entertainment technology. The combination of our backgrounds gives us a very unique perspective that has already proven very useful in the development stages of this idea.

### Project Description

Our plan is to build a desk frame using 80/20. We will then use glass or some strong transparent material to act as the desk surface, and on the bottom of it we will attach an adhesive diffused film for rear projection. This will allow for users to view live projected images (using two projectors mounted on the bottom-back of the desk) on the surface of the desk with a holographic effect due to the transparent nature of the surface. Because the projector is under the surface users will not have to worry about the image being obstructed by hands and other objects above the surface. Haptic feedback, able to be felt and heard through the surface, will allow users to be easily notified when they have a notification or error that needs attention.

The surface will be dry-erase friendly, and will allow for food, drinks, keyboards, mics, etc. to be placed on the surface without worrying about water damage or wear and tear.

### Educational & Social Benefits

The Holodesk can be used by anyone looking to enjoy a seamless, interactive workspace. However, our team is interested in creating the holodesk to explore unique and interactive teaching methods.

Specifically, we are interested in developing the Holodesk to be used to increase access to education for low-income students in areas where educational resources would be otherwise hard to reach. Many studies show that a significant number of schools in lower income areas endure countless obstacles, which all exist at the cost of the students' education. One such obstacle is the fact that lower-income schools often don't have the funding to purchase new textbooks, and are therefore forced to use outdated textbooks that are in poor conditions. Having a holodesk in the classroom would create a fun, engaging, and challenging educational experience that, due to its internet connectivity, would not be subject to out of date material. Overall, our team is incredibly excited about the good that the Holodesk could do in the educational space.

### Market Precedence & Distinction

I'm willing to bet that this proposal is not the first time that you have encountered the idea of a smart/interactive work surface, so what makes ours experimental and different?

The holodesk would be significantly cheaper than the already existing smart surface counterparts, because instead of employing a 55" touch monitor with capacitive touch, we would use rear projection to display the image, and a Kinect sensor to receive human input. A rear-projection smart surface that uses computer vision for input would be a much more unique, and much cheaper, idea than the majority of the smart surfaces that are being distributed in the market today.

Another unique benefit of our product that is not widely seen in the currently existing smart surfaces would be its durability. If a user spills liquid on a conventional smart surface, for example, they'll have to worry about potentially fatal water damage. Outside of major amounts of liquid getting into the projectors, users of the Holodesk would generally not need to worry about water damage. If the surface gets scratched or broken, instead of having to replace the entire device, touch technology included, users of the Holodesk would be able to simply replace the glass surface. Complications arising from touch interference the palms of hands, or miscellaneous objects on the screen, would be significantly mitigated if not altogether eradicated from this difference approach that we're taking to interactivity. These are examples of some of the many ways that this product was designed with the classroom in mind.

### Conclusion

The successful completion of the Holodesk would have monumental consequences. Not only would it serve as a great opportunity to explore workspace design and using technology to create more efficient processes for people's everyday work lives, but it could increase access to education on a large scale. Please look favorably upon this request for funds so that we may continue our tireless work on this idea and someday touch the lives of others.