SEC Directed Internship
Final Report

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Introduction

Our original problem statement was: Hands free, air gestures to control computer interfaces. Manipulating images in the OR, ER or places where sterile conditions prevail and contact with non-sterile elements is prohibited. This is what guided us in choosing our solution for the problem of contact with non sterile elements.

From there we decided the main problem to fix in an ER and OR is that in the operating room there are visualizations to assist doctors in surgery. The problem then arises when the doctor needs to adjust this visualization and the nurse in charge of the machine is not there. Normally this problem is solved by having a nurse in charge of the machine. That way they can be non-sterile while touching the non-sterile interface. The problem then becomes when the nurse is not there or there is a shortage of nurses, like right now during a pandemic like covid and there is 30% less staff in the OR's and ER's, there is just not enough nurses to keep a nurse just for the non-sterile computer. This could risk cross-contamination from having the surgeon move the interface himself or having a sterile nurse perform the basic nurse job, such as preparing the patients for

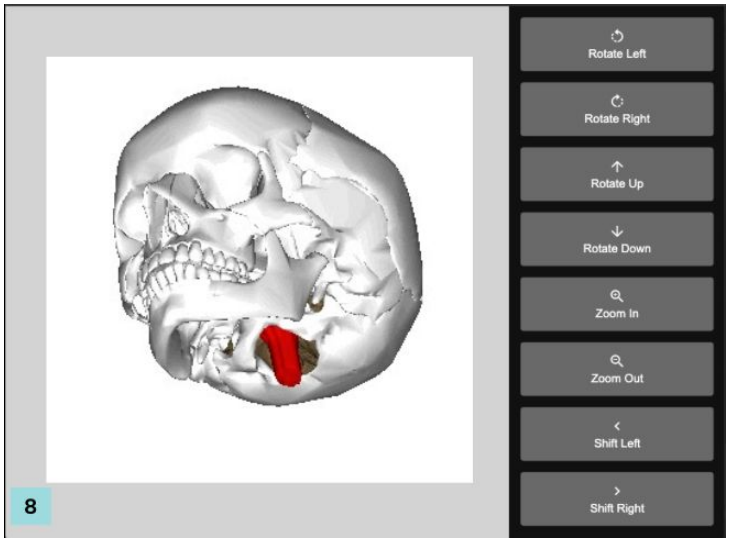
surgery, and the non-sterile computer such as moving the interface around.

To help with this problem, we created Sterile Speak. A technology driven healthcare solution that uses voice command to move around the computer interfaces so that no one has to touch the interface. This way surgeons do not have to take their hands off their patient and they do not have to wait for a nurse to do it for them. The next section will explain what it is and what this technology does.

Design

Sterile Speak is an application that uses voice recognition to allow for remote control of computer interfaces in the operating room. We made it so doctors and nurses will no longer need to physically touch screens or keyboards in order to adjust their medical visualizations in computer assisted surgeries. Now they can simply speak out commands and have the visualization move hands free. This allows for a more sterile environment, while also allowing the doctor to keep their hands on the patient.

Despite being an established technology, speech recognition has yet to really be implemented into the Operating Room. We see it everyday in our homes and technology with products like google assistant, Alexa, and Siri. So why not introduce this tech into our operating rooms too? Our idea combines the effectiveness of medical visualization with the practicality and convenience of speech recognition. We provide a hands-free option for doctors or nurses to interact with computer interfaces in a way that is sterile, innovative, and effective. You can see below how the application would look ideally.



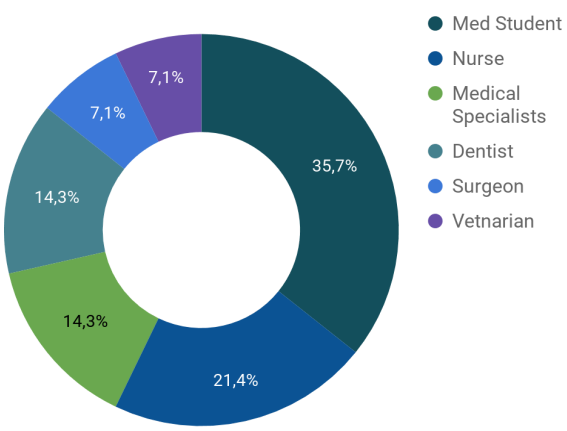
If you were a surgeon in the operating room doing a computer assisted surgery that requires you to not take your hands off the patient. What would you do if you need to adjust your visualization to get a better angle in order to move to the next step? Right now, you would have to ask a nurse to physically adjust the visualization. With the assistance of Sterile Speak you would not need to go through a nurse, all that needs to be done is say “Sterile Speak, rotate right 30 degrees”.

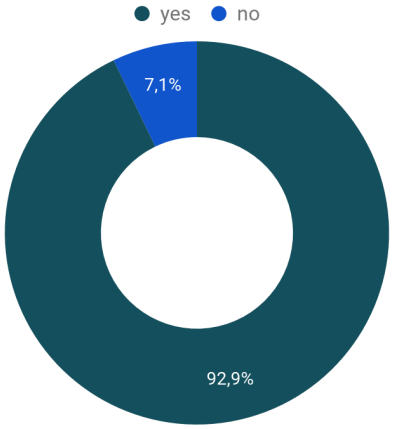
By doing this you are not only able to interact directly with the computer interface without the assistance of another person, but are also able to keep your hands on the patient and not need to touch anything except what is explicitly necessary. This is especially useful right now during COVID-19 where there are 30% less personnel in hospitals, and the luxury of having personnel to touch computer screens is not practical. Sterile Speak allows for doctors to have more control over the surgery in an innovative and convenient way.

Marketing

For our marketing plan, we decided to implement a three step process. The first step we started with was research. The way we did this was by conducting surveys and interviews to identify the overall reception of our idea and by quantifying how much improvement our product could achieve. The second step would be to pitch to the hospitals, and go to them and identify the need and profit potential for our project and also show that there is profit to be made. The last step is to pitch to software companies that work with medical imaging and use sterile speak to explain why they should implement this product. Then given hospital support, show there is a market for our solution.

Survey Results:





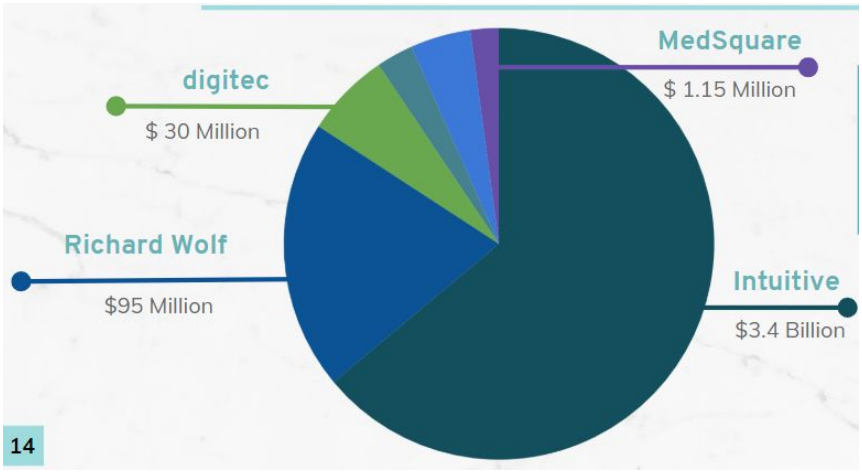
When we conducted surveys, we interviewed people from many different fields such as nurses, surgeons, med students, dentists, vets, and more. Our team wanted to get a variety of different medical professionals so we could determine who exactly to market to. The results from the chart on the right shows we do not need to limit ourselves to just surgeons or people who work in operating rooms, because 93% of the people we surveyed, work in sterile environments where they touch non sterile computers. So this data shows our product can be marketed to a wide variety of medical professionals.

From the previous results we decided to market to medical imaging software companies so they could integrate sterile speak into their software. These companies work to manipulate medical images with their software.

Companies we plan to market to:

1. Intuitive
2. Medsquare
3. Digitech
4. Merivaara
5. mediCAD
6. RichardWolf
7. Infraredx
8. Zscan
9. Eizo

Market Breakdown



When we looked more into these companies, determining the correct market segment is important because we didn't want to market to medical companies that have no relation to our product so we looked at the market segment for medical imaging specifically. Once we did that we were able to find 9 companies as seen in the previous slide. We found data for 7/9 companies. The two we couldn't find data for were Merivaara and mediCAD because those two are smaller branches of bigger companies. Out of the 7 of the 9, the total revenue adds up to about 4.8 billion dollars.So overall the revenue is a little larger than that if you include the two other companies.

As you can see from the graph, medsquare is one of the smaller businesses. That is where we would start in terms of integrating our product, and once we have a partnership with them, we would try to go after bigger business and then eventually tackle Intuitive because they are currently leading the market in medical imaging.

Sales

Sales Strategy

The medical industry is risk averse by nature. Implementing new methods of practice can put patients at risk and open hospitals to liabilities. Sterile Speak is designed to be integrated into systems that are already in use and won't disable their original functionality. The fact that Sterile Speak is risk free and creates versatility in the operating room is our main selling point. We will target smaller companies with a single product to gauge our workload and determine the time and cost when we start to move on to larger and more complex projects.

Our plan is to work with a medical sales specialist and offer discounted annual fees to incentivise new investors in the beginning. As we become more established in the medical world, we will grow our engineers and technicians to start targeting larger companies. Our end goal will be to become the standard in the medical field.

Pricing Strategy

	Basic	Standard	Sterile
Base Fee	$50k/per model	$100k/per model	$200k/per model
Annual Licensing Fee	20% of Base Fee		
2D Control	✓	✓	✓
3D Control	✗	✓	✓
Voice Recording	✗	✗	✓
Cloud Services	✗	✗	✓

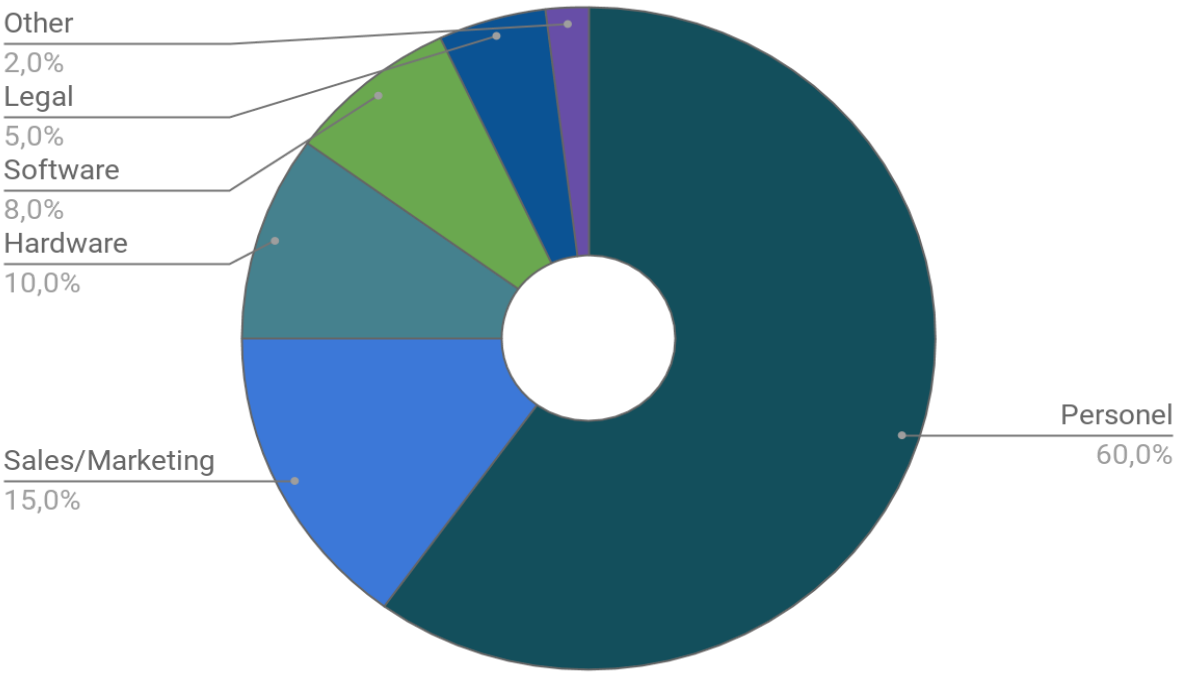
The pricing model will be a 3 tiered system with different base installation fees and a set percentage for annual licensing. The basic package will be our lowest tier which would simply be used to manipulate 2D images. Our standard package will be the primary focus of our sales as interacting with 3D images really displays the usefulness of our solution.The sterile package will include features such as voice recording and storing on cloud services. Possible new features to add would be controlling the position of the computer display using voice commands.

The base fee seems large, but our customers are software companies that sell to thousands of hospitals with prices that can range from $5,000 to $100,000 . As our company grows, our base fee will move towards a quote based system, calculating our prices based on the complexity of the software we are integrating with and the demand.

Finance

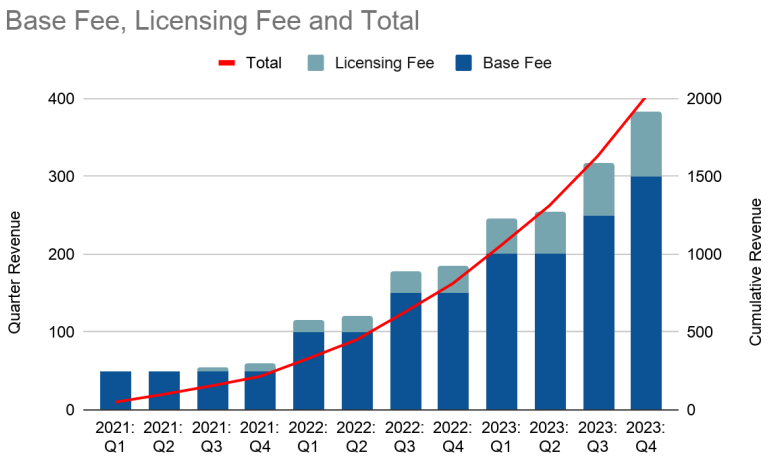
Capital Need

In terms of capital need, to make this work we will need approximately $300,000 which would be divided up into 6 categories. 60% of it for for Personnel, such as our employees, engineers, and office space, 15% for would be for sales and marketing (like as a website, brochures, etc), 10% would be for hardware (such as the actual product to build out our product), 8% for software which would include the maintenance and updates, 5% for legal, such as the patents and permits, and the rest, 2% for other unforeseen expenses.



Revenue Forecast

Based on the sales strategy and the pricing strategy, this is what our revenue forecast looks like for the next three years:



The first year will be spent working closely with our customer to ensure everything works smoothly and help us establish our name. In Quarter one and quarter two of the first year, we reflected the incentive for the licensing fee in the sales strategy and did not add it to the forecast until quarter three. After year 1, and everything runs smoothly as we work closer to reaching our goal in becoming industry standards, we are able to add more and more companies every year to establish this upward curve. Notice that based on the graph, we are able to make our capital back after one and a half years, making it very profitable.

Conclusion

In summary, Sterile Speak is a Speech Recognition Solution that allows for doctors and nurses to be able to interact with computer interfaces with a simple audio command. It allows for medical professionals to keep their hands on the patient and not require third party assistance. This project is highly feasible due to speech recognition examples we see in our everyday life like Siri and Alexa, however our idea adds this innovative technology into the operating room; giving doctors new tools to assist them in surgery.

There is also a market for this product. Despite being a relatively niche market, it is an essential one in today's ever evolving technical environment. These companies are the future of medical imaging and are also projected to grow as technology gets better. We plan to grow with these companies as well and help set the industry standard for Operating Room interfaces. From our research we have found overwhelming support from the people who could potentially use our product which would make them more resourceful in their jobs, and will not only help us market to our future clients by showing them potential profit but will also help innovate the field of medical imaging.

Until we really get started we plan to start small by offering heavy discounts to our first potential clients, but as we grow we plan to adjust our pricing strategy to take into account more experience in integrating our software and also the growing market. Our projected growth estimates a return of investment within a year and a half and are exponentially increasing due to slowly becoming the industry standard.