Team 7
Real-time Tele-Medicine in Ophthalmology

Project Plan: Size, Risk, and Schedule Estimate

Author	Contribution
Sam McCauley	N/A
Shelby Stocker	N/A
Cole Terrell	Section 1: 430
Bryce Kushner	Sections: 2, 3 Word Count: 619

Size Estimate

The size estimate for our project will be given using story points, as the number of functions/lines of code required is not well understood at this early stage of our design process. The scale will range from 1-5, with 1 signifying a task that is simple and will require little effort and 5 signifying a task that is complex and will require a great effort.

A.) The most critical function of our product is the transfer of a high-resolution video stream from cameras mounted to an ophthalmologist's slit lamp to a portable viewing device as well as a virtual reality viewing device.

Story Points: 3, while this is the most critical function of our product, we already have some code to work from, and we are not as concerned with potential latency issues for the local stream as we are with the remote video stream. Overall, this task is moderately complex and will require a moderate effort to complete.

B.) The next function that our product shall have is the ability to stream the high-resolution video over a network connection to a remote viewer (with VR capabilities also). This stream must have low-to-moderate latency, as the stream may be used for applications such as guiding a resident through a procedure in real-time or acquiring a second opinion from a remote-located physician.

Story Points: 5, this function is not as critical as the local stream, but our customers have demonstrated the immense potential that such a function could have to revolutionize remote medicine; thus, it is still of great importance to our team. Minimizing the latency over the network connection will likely be a challenge in addition to the fact that our customers require ultra-high resolution video. Overall, this task will likely take the majority of our time and effort to complete, and it will almost certainly be the most challenging part of our project.

C.) The last function of our product will be to record and store the video stream that we capture for later use. This function may present storage challenges, as the 4k resolution video will likely be very large. We may need to learn about video compression or invest in large amounts of external storage.

Story Points: 2, this function will not be as challenging to implement, as saving the video stream should be quite simple to implement on any of the machines that are receiving the stream. The tricky part will be the efficient storage of the video so that it is portable and scalable, but there are simple solutions in existence already.

Risk List

There a couple of key risks that stand out with the core requirements of our project (security and quality) and then a few that encompass later stages of the project that are an extension to the core functionality our customer is looking for. Considering we are still in the early stages, we will have a better feel for the actual potential impact and trouble with these risks as we dig deeper into the project.

A.) One key risk will be ensuring the security of the web server that is hosting the live stream. This will be important to ensure confidentiality for patients and compliance with HIPAA regulations. To mitigate this risk we will need to spend time making sure our server is effectively encrypted to prevent access from unwanted parties.

B.) A second risk will be ensuring consistently high quality in our feed. The stream is going to be used to assess patients and when observing something as intricate as the human eye any sort of distortion could lead to a misdiagnosis. Any sort of fault in quality could be a major issue for our customers.

C.) A third risk will be dealing with latency with the live stream. The live stream could have applications with connecting off-site physicians to surgeries and so if the stream isn't being transmitted effectively that could create issues for the operating surgeon if they are depending upon another professional who is watching via the live stream. We will have a better idea of the potential risk here once we have a prototype model running and have a base case to judge potential latency issues. Although, the primary focus of this project is to ensure a live feed for a local host and then being able to stream it off-site for more of a consulting type setting vs a surgery. In this scenario the latency isn't going to be detrimental, so for our initial purposes, this risk shouldn't be a major concern to our project.

Schedule & Allocation of Resources

Our team is still in the preliminary stages of development and getting accustomed to the base elements of our project so it's hard to have a distinct schedule and delegation of resources put together. Our lead customer is currently out of town until October, but he is using October as a research month here in town and wants us to use that time to get a majority of the work done. We are planning on having weekly check-ins with our customers via email, and formal meetings every two weeks to make sure we are keeping on track to have a complete product by the end of the semester. As we get more accustomed to the project we will be able to further delegate our resources to specific areas each member is most familiar and/or effective in. For now, we are taking on more of a group programming method as we all get accustomed and up to speed, and we have found that to be effective so far. This isn't a project that necessarily has many completely independent parts that are split up so it has worked well for us to take on a group programming approach.

In terms of general level schedule, our first goal is getting the local feed up and running, followed by hosting a live stream of that local feed to give access to it off-site. From there, we will be working to improve latency and finding methods to most effectively and consistently provide the highest quality. Generally speaking, we hope to have the local feed up and running by early October, followed by a base prototype of the live stream up and running by the end of October.