

Interactive 3D Virtual Reality Analysis Solution for Doctors



Ron Schilling
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CEOCFO: *Dr. Schilling, your site indicates Echo Pixel is building a new world of patient care. What is your approach?*

Dr. Schilling: If we take a look at a situation analysis, we start off with the incredible pressure on the medical system today. Doctors are overworked, costs are rising, and they do not have the tools to enable them with this kind of pressure to maintain the clinical results that they need and do it in a meaningful time. Our solution is based on cutting-edge technology and what we call interactive virtual reality. It gives the doctors an entirely new way of looking at the anatomy instead of struggling with two-dimensional views. We give doctors a 3D view directly, and then they can spend all their time providing a solution. We just recently visited a hospital that was a perfect example of this situation analysis.

CEOCFO: *Would you give us an example of how this works?*

Dr. Schilling: At this hospital, we were speaking with the gastro docs and the radiology docs. The gastro docs are overloaded with patients for colonoscopies, so they are pushing patients to virtual colonoscopy, which is done in radiology. In radiology, virtual colonoscopy with present technology takes too long because of the problems with 2D imaging. For example, it typically takes them 30 to 40 minutes. We have shown through work at UCSF that we can do these kinds of tests in about five to eight minutes, which is significant. Instead of losing money for a study, they can make money for a study. In addition, there is a lot of fatigue that takes place when they do these studies, and at UCSF they have shown much less fatigue or any at all. They are doing five to seven in a load without measurable fatigue. The key to all of this is clinical results (which we call clinical efficacy) and workflow (the time to do the study). Our technology is able to affect both.

CEOCFO: *What is the technology? What have you developed to allow this?*

Dr. Schilling: Let me explain how the EchoPixel technology works. If you think about an object on a desk coming out from a display, we can interact with that object. We call it True 3D, which gives you the ability to interact and the ability to analyze and cut through an object. For example, we can cut through a brain and we can find the tumor and directly remove that tumor. We can do this all electronically.

CEOCFO: *How are you able to do it?*

Dr. Schilling: We are able to do that because number one, we have displays that provide stereo capability, and we built in the software that provides for all this interaction. It starts with a CT scan or an MRI scan or ultrasound, just like the normal studies, and it then comes into our system. The objects then show themselves directly on the display in True 3D. It actually stands out from the display.

CEOCFO: *Is it tough to explain the advantages to doctors? What is the necessary training? What might be the stumbling blocks in that area?*

Dr. Schilling: Typically with all new technology, it's initially tough to explain. I brought CT scanning to market, MRI to market, and even with those machines that are commonplace today, initially it was very difficult for people to learn exactly all the benefits. However, today with the stream that people have with 2D views and the pressures that they feel in time, it is all about speed today. They can immediately see how they can relieve that pain with True 3D from Echo Pixel. That is the beauty. They know that they are able to solve a significant problem that they have in doing their job, and therefore I would say training takes maybe an hour or possibly two hours, and they are so interactive with the system. It is intuitive, and it is very easy for them to understand how to work it. With surgery especially, surgeons love it because they are

always cutting into an object. As one surgeon told us, I have never opened up a patient and seen a 2D view. It is very meaningful for radiology as well.

CEOCFO: *Where are you in commercialization?*

Dr. Schilling: We have activity at UCSF in virtual colonoscopy. We have activity at Stanford in pediatric cardiology, and we have activity at the Cleveland clinic where we are doing work in the liver. It is called the TIPS procedure where you put a shunt from the hepatic vein to the portal vein. It is a very complicated procedure. In all of these cases, we have been able to show improvements in clinical efficacy and workflow.

We have a number of systems in Taiwan, with a company called Foxconn, and they have a division called Healthconn. What they discovered when they first saw this was the ability to use True 3D for patient education. We are very excited about that whole model that they are developing with us. These clinics operate for the purpose of helping patients understand when they have an operation on the shoulder what is really going on. With 2D views, can you imagine any of us understanding what is happening in our shoulder? If you see it as an object and you can cut right into the shoulder and see exactly what the problems are, it is very powerful. We also have business in Australia already where we have sold a number of systems for a number of applications, and patient education there as well is a very important factor. We have both clinical and educational types of applications.

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CEOCFO: *With the projects that you are working on now in various medical settings, were you looking to do those specific targets or was it more that these organizations were willing to consider? How did you come about those particular items for a first round?*

Dr. Schilling: EchoPixel was already working in virtual colonoscopy when I met Sergio Aguirre, the founder and CTO. I told him we needed to meet with Dr. Judy Yee at UCSF, since she is one of the most knowledgeable people in this field. We went up to see Dr. Yee, and Dr. Yee was very impressed with the measurements that we showed her where we could see flat lesions in the colon. These are the most difficult things to see, because flat lesions are up against the wall. Because we have stereo capability, we were able to see them. She agreed to work with us in developing what we call a protocol. A protocol is a series of steps to allow the physician to get the very best results in clinical efficacy and workflow or speed.

At Stanford, we spoke to a number of people there and we found an area of pediatric cardiology where they were very passionate about it and we realized that our technology could make a significant difference. The surgeon believed that he could do one particular operation in one and a half hours versus four hours. This is in cases with an infant of a few months old, where the pulmonary artery is not functional and the aorta sends out these sub-millimeter vessels to the lungs. If it did not do that, the infant would die. When the infant is born, they have to be replumbed. You have to understand the network of these vessels and then change them around so that they are functional. You cannot do it with any accuracy at any reasonable time when you are using 2D imaging. It just takes too long. We're about to start some clinical trials there as well.

CEOCFO: *What is next?*

Dr. Schilling: If we think about the general direction that we are taking, we start out with a software platform, and it is enabling interactive virtual reality. It is good for diagnostic purposes, surgical planning purposes, and treatment purposes. In each area we are developing protocols. However, we also believe that we can allow doctors to utilize machine learning algorithms based on the expert interactions that are taking place. Going forward, with a doctor's permission, we will be able to monitor expert interactions as the doctors are using the stylus, and we will be recording this information to be able to then find the best approach. We can find best practices in improving clinical efficacy and workflow. We are now setting up a number of sites in virtual colonoscopy as the first machine learning area, and we have been talking to a number of key sites about working as a parallel effort to the work we are doing at UCSF. Machine learning is going to be very valuable here in improving and getting the best practices at all of our sites. That is the next wave.

CEOCFO: *Are you funded for your next steps?*

Dr. Schilling: We started off for a few years with sweat equity. That is the name of the game in startups at least in the Bay Area, and then we started with a seed round. It started in September of 2012, and it ended in November 2013. We

raised \$3.8 million during that time. Those funds then will carry us through to the summer of this year. A few months ago we started to begin the process of raising a series A round, which will then take us to break even down the road.

CEOCFO: *For the investment community, are you working in an area currently in favor?*

Dr. Schilling: When they look at what we're doing, they want to get an input from doctors that they know. In a number of cases, they would send us to their key doctors in the area. We had a visit, for example, to neurosurgery at UCSF. They were blown away, and they got it right away. What amazed me was they took the stylus and they started working it in a way almost as well as our experts can. Therefore, their feedback was very positive. The next thing they want to know is what is our strategy. We have a fairly well defined strategy. It is very simple, and it starts with what we call the clinical-technical tie. That means that we want to understand the clinical need--We want to work with a doctor to understand the real, fundamental need and then bring the technology to solve this problem that is required in that clinical need. We then want to engage with luminary centers to bring these particular problems to solution. We like the concept of a triangle, consisting of a luminary doctor at a key center, a corporate partner, and ourselves/ The corporate partner is the source of the information, and the corporate partner knows their equipment much better than we could learn it, and they bring that knowledge to the party.

CEOCFO: *What is the competitive landscape?*

Dr. Schilling: If one works in the literature, one will find 3D as the expression for all of the systems where there is 3D volume data from CT and MRI and the views themselves are only in 2D. They call that 3D. We refer to that as 2.5D. When you say 3D, there is 2D, 2.5D, and there is what we do, which is True 3D. With True 3D, one can really differentiate ourselves from the competition that is in the 2.5D game. When we mention corporate partners, these corporate partners all have their own displays with their existing systems, which is 2.5D. They are working with us to provide them the capability in True 3D – interactive, virtual reality. That is where they want to go, and we have the technology.

It is not easy for the large companies to work in all these specialty areas because there is a lot of uncertainty in medicine with the ACA and other things going on. Hospitals are not buying like they did before, and therefore there is more opportunity for corporations to want to work with small companies as partners. That is why that is a very important part of our strategy. There are some companies out there trying things like this, you are never alone, and that is just fine. We welcome that, and we do not want to be the only game in town.

CEOCFO: *Put it all together for our readers. Why pay attention to Echo Pixel today?*

Dr. Schilling: Echo Pixel is clearly meeting the needs that are taking place in the marketplace. We talked about the pressure on the medical system and we looked at an example. We are bringing surgeons and radiologists together in a solution because we provide the language to bring them together. The application of interactive virtual reality to objects in open space provides intuitive ability, and intuition and cognition, together add up to knowledge. This game is all about knowledge. Doctors need to get that knowledge quickly and make a meaningful decision, and with our technology they are able to do that.

Interview conducted by: Lynn Fosse, Senior Editor, CEOCFO Magazine



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