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Surgical Automations - visionary founders developing automated surgical robots for endoscopic procedures. The Future is Now.



Dr. Sanket Chauhan
 Founder/CEO

Surgical Automations

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"We are the only company that have used AI and ML not only to detect the specific anatomy, but then couple up with robotic and automation technology to perform interventions." Dr. Sanket Chauhan

Interview conducted by:
Lynn Fosse, Senior Editor
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CEO CFO: Dr. Chauhan, what is the overall vision behind Surgical Automations?

Dr. Chauhan: At Surgical Automations, we are developing autonomous endoscopic robots that can assist the surgeon during endoscopic procedures. Every surgery consists of various steps and some of these are more technically challenging than others. The Surgical Automations' autonomous robots can automate these technically challenging but critical steps of the endoscopic procedures. In addition, we have an IoT based infrastructure that enables us to provide an integrated stakeholder experience.

Our core technology is what we call Automated Robotic Endoscopic Navigation (AREN), where we use the AI/ML algorithms to train the robot to identify the target anatomy. Once the anatomy is identified, then through robotics and automation we can perform a wide variety of indicated interventions automatically. The new age surgeon will supervise and instruct these robots to perform these interventions, controlling them via a tablet like wireless interface. The complex psychomotor skills that take a long time, training and effort to acquire will no longer be required as the robot will be able to do those complex tasks automatically under the physician's supervision. This will result in safer and more efficient surgeries.

CEOCFO: *Would you give us an example of where some of the challenges are during an endoscopy and how automation helps?*

Dr. Chauhan: There are several kinds of endoscopic procedures, such as upper GI endoscopy, colonoscopy and sigmoidoscopy, cystoscopy and ureteroscopy, intubation and bronchoscopy, etc. In bronchoscopy for example, the physicians have to navigate the snake like bronchoscope through the mouth into the trachea entering the bronchial tree. Imagine a tree with multiple branches – an interventional pulmonologist has to navigate that tree from the ground up to the last branch of this tree and inspect essentially every leaf, bud, nest or acorn there is, and often do interventions. Getting to each branch requires acquisition of complex skills whether it is movement of a couple of knobs that control the direction of the scope, along with rotating their wrists. Even the newer technology has an Xbox or PlayStation remote like user interfaces that are used for navigation. Mastering these requires years of intense training.

With the Surgical Automations AREN technology, all of this can be automated, and the user interface is a much more intuitive wireless tablet like touchscreen interface.

CEOCFO: *What have you developed so far and where are you in the development process overall?*

Dr. Chauhan: Any MedTech product goes through several phases of prototyping and formal verification testing with design controls before it can go through further tests and validation studies for the purpose of FDA or other regulatory bodies. From a product development standpoint, generally, most MedTech startups have three big prototype specific milestones – the Proof of Concept (PoC), alpha and the beta prototype. The PoC prototype marks the complete de-risking of the technological feasibility, the alpha builds up on the PoC to develop final design including the industrial design, usability etc., which is then transferred to manufacturing to create a beta prototype. All the regulatory tests are performed on the beta prototype.

We developed a PoC prototype last year, and are close to finish our final alpha prototype. The supply chain issues associated with COVID-19 along with the worldwide shortage of chips has put us a couple of months behind our initial thought of timeline but we are progressing every day closer to the next milestone.

CEOCFO: *Are doctors comfortable with automation and AI today, or is it still not as mainstream as one might think?*

Dr. Chauhan: Automation has been embraced in almost every industry. Airlines have used automation for a few decades now – commercial flights for example have fully automated landing and follow a predetermined path. Manufacturing industry has gone all in by automating the steps related to manufacturing and packaging. We are seeing more and more automated robotic cleaners in shopping malls and vacuum cleaners in homes. Cars such as Tesla have the auto-drive modes where the car automatically drives you from point A to point B.

Technologically, MedTech companies are generally a few years behind other industries. It has because of the extremely long product

development cycles, regulatory requirements, clinical trials if needed, etc. In contrast, tech companies can soft launch a “beta” product just to test the market and gather feedback, which can be catastrophic for MedTech companies. In healthcare, it is being used more frequently than you might think. Almost every surgical robotics company is using some form of automation. To the best of our knowledge, we would be the first surgical robotic company to use AI/ML for anatomy identification and combine it with robotics and automation to do interventions. We are not really inventing new physics, but using technologies that have been validated, tested, proven to be safe and efficient and helpful to consumers in other industries.

CEOCFO: *What did you learn as you started the venture that surprised you?*

Dr. Chauhan: Entrepreneurship is a journey that tests your grit, resilience, patience, perseverance and teaches you a lot. During this journey, we have learned to be humble, handle adversity with grace, be thankful to our friends and families and believers. We have learned to ask for help – sometimes that is all you need to do. Our company started early in 2020, just before the world broke down with the pandemic. We were so new that we were ineligible for all the forgivable PPP loans, so the initial days were tough, but in retrospect, it was a joyous ride. We were surprised by the amount of help and good advice that is available to those who are able to ask and listen.

CEOCFO: *Development and commercialization is always expensive. Are you seeking investment, funding, partnerships?*

Dr. Chauhan: We oversubscribed our seed round last year and we were able to hit more milestones with it than we initially proposed. We are thankful to our early investors who believed in us and we are here because of them. We are starting our \$6M Series A raise in March 2022 at the Emerging MedTech Summit at Dana Point, CA and are looking forward for investors and partners. This will help us develop more products in the pipeline while completing and submitting regulatory requirements for our initial automated endotracheal intubation robot. We welcome all potential investors, partners, contractors and potential employees to reach out to us.

CEOCFO: *When you are talking with someone from the investment community, do they tend to understand pretty quickly? Are there some challenges in getting the idea across?*

Dr. Chauhan: We have noticed one thing for sure - MedTech investors are MedTech investors. If you go to investors who invest typically in oil and gas, or cryptocurrency they are probably not going get it. Even in healthcare, we have funds focused on pharma or biotech and therapeutics – they might get it more than oil and gas investors, but the actual niche is those of MedTech investors and they get it completely. Even in MedTech, most firms have their investment thesis that they strictly follow. Depending on the sophistication and niche of the investors, they understand the problem, our solution and the technology behind it, how long and how much will it take to commercialize it.

When you start fundraising, you have to talk to everyone. We just need a few groups of sophisticated investors who believe in us. If out of 100,

we get 2 or 3 of those, that is okay. The other 97 are welcome in the next rounds.

CEO CFO: *What is involved in training the doctor? How do you make it as easy as possible?*

Dr. Chauhan: For training, we have developed a touch screen which has an intuitive user interface so you do not have to stand next to the patient in an ergonomically challenging position holding the scope and controlling the knob with one hand while trying to navigate through other hand. There is a stand that you can attach the robot to. You will sit on your chair and can control the endoscopes wirelessly. We believe that usability and user experience is most important and easily overlooked part of development, and we have paid special attentions to things like user interfaces, learning curve, latent conditions etc. Training wise, even with the most user intuitive interfaces, you still have to have train to know what button to press and get used to the user interface.

The goal behind this is to reduce the burden caused in the process of developing and maintaining sophisticated skills that are needed for surgery. We believe that medical device companies are equal stakeholders in making the procedures safe for the patients.

CEO CFO: *With so many new ideas in medical technology, why does Surgical Automations stand out?*

Dr. Chauhan: All of our robots are less than 5 to 10 pounds, depending on the use case. For example, the handheld part of the fully portable intubation robot is about 2 lbs. pounds. We are the only company that have used AI and ML not only to detect the specific anatomy, but then couple up with robotic and automation technology to perform interventions.

In addition to being a surgical robotics company, our core philosophy is to ensure an integrated stakeholder experience. I will again give the example of Tesla - while any car could take you from point A to point B, and yes, they went all in and did a great job on building electric cars, Tesla is not just about driving an electric car. If you go sit in a Tesla and take it for a test drive, at some point you will inevitably say – “wow”, and that is not just because you are driving a great electric car, but because of the experience you have while driving a car. Enabling an integrated stakeholder experience whether it is patient, physician, hospital or the device manufacturers is important to us, and we have heavily invested in an IoT infrastructure to build connected medical devices, and make that user experience possible.

