PROJECT SNAPSHOT

Surgical Robotics: Proof of Concept to Productization and 510(k) Submission

PIONEERING THE DEVELOPMENT OF REMOTE TECHNOLOGIES TO ENHANCE ROBOT-ASSISTED SURGICAL DEVICES

SITUATION

- Develop a next-generation advanced surgical robotic system with remote control capability
- New system must enable clinicians to perform cardiovascular intervention procedures remotely, with the clinician and patient in separate locations (i.e., Boston to Los Angeles, not just on the other side of the Operating Room wall)
- Video must stream in 4k quality with unrivaled low latency
- Robotic controls must be intuitive, real-time, safe and reliable

CHALLENGE

- Develop a Proof of Concept (POC) within 12 months to verify that the next-gen product could be built using currently available technology for video and networking hardware and equipment
- Quickly evolve from a lean R&D team focused on Proof of Concept to full-scale Productization across all software disciplines
- Evolve an existing product/technology by expanding its functional capabilities to incorporate remote operation
- Improve the overall user experience and enhance procedure success
- Requires niche expertise with robotic controls, video compression algorithm and codec development, QNX/Windows/Linux and Qt technologies – all core aspects of the new product
- Limited in-house resources to meet aggressive development schedule

SOLUTION

- With a team of 20+ software engineers and a project manager, MedAcuity developed the software for system control, robotic control, user interface, cloud connectivity and DevOps
- Developed a video pipeline comparable to the video quality of Netflix – capable of streaming fluoroscopic video in 4k, real-time that is visually lossless
- Sourced all product components from scratch – evaluated, qualified and selected all hardware, tools and equipment for the development of the product
- Robotic drive had incredibly tight tolerances and control
- Successfully collaborated with client vendor partners responsible for user interface/experience, hardware and electrical for physical system controllers
- Performed tool validation and all system and software testing – manual and automated
- Built a fieldable system, providing a path to success with a production-ready device instead of a prototype

RESULTS

- Reused as much of the Proof of Concept for the productization phase – saving the client time and money
- Achieved productization in 2.75 years and created a scalable platform to build future releases to ensure the team could immediately begin development
- MedAcuity and client team members successfully integrated, resulting in a *"one-team"* mindset – fostering effective communication, collaboration and synergy among team members, leading to increased productivity and the success of the project
- Supported client's De Novo Investigational Device Exemption (IDE), Human Factors Engineering (HFE), Clinical Usability Studies processes and prepared for 510(k) submission

ABOUT MEDACUITY

MedAcuity, a software engineering firm, partners with companies to address the business and technical challenges inherent in developing complex software-intensive solutions. Offering a combination of strategic consulting services focused on aligning product technology strategy with business goals and full lifecycle software development expertise, we accelerate the pace of innovation for leading companies and innovators in the MedTech, Life Sciences and Robotics industries. With over a decade of experience in software design and development methodologies for highly regulated and compliance-driven environments, our technical capabilities span all levels of software from embedded systems to mobile devices, the cloud and enterprise technologies.

Accelerating the pace of innovation while reducing development time and risk.

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