FROST & SULLIVAN

Clarius Mobile Health Corp

2022 TECHNOLOGY INNOVATION LEADER

North American Portable Ultrasound Industry

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Clarius Mobile Health Corp excels in many of the criteria in the portable ultrasound industry space.

Next-generation Portable and Affordable Ultrasound Scanner

Point-of-care ultrasound (POCUS) has become an integral part of emergency medicine (EMED) and critical care for over two decades owing to its ability to speed diagnosis, triage, and improve patient outcomes. The clinical applications of POCUS in emergency medicine are similar to those of critical care ultrasonography including thoracic ultrasonography, echocardiography during cardiac arrest, goal-directed echocardiography, evaluation for deep vein thrombosis and pulmonary embolism and ultrasonography in trauma. Besides these applications, some specific use of POCUS for emergency medicine include ultrasonography for ocular emergencies, small bowel obstruction, musculoskeletal complaints, soft tissue infections, first trimester pregnancy as well as biliary, abdominal vascular, and urinary tract ultrasound.

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> ***- Neeraj Nitin Jadhav, Industry Analyst***

In recent years, portable ultrasound devices, including laptop-based and wired handheld ultrasound systems, have also helped health professionals triage patients affected with COVID-19 and determine the need for subsequent imaging, thus reducing the exposure of other clinicians to the virus and preserving resources, such as workforce and equipment, of the health

facility. In 2019, the American Society of Echocardiography (ASE) recognized the importance of POCUS devices in enabling the quick, bedside assessment of a patient's chest, heart, and vessels, pushing these tools to the front lines during the fight against COVID-19.

Even though portable ultrasound devices have played a pivotal role in delivering better patient care, they have their own share of drawbacks. For example, laptop-based ultrasound systems are priced between US $15,000 and $50,000 per unit, making them out of reach for healthcare facilities that have limited scan volumes and budgets. Wired handheld ultrasound scanners are priced considerably lower than laptop-based ultrasound systems; however, they do not provide the premium quality of performance and imaging as provided by the latter, impacting the level of diagnoses in patients. Moreover, the presence of cables in wired handheld ultrasound scanners increase infection risk and can make the entire imaging process cumbersome for clinicians, which could affect the quality of imaging.

To address the limitations of laptop-based and wired handheld ultrasound systems, Vancouver-based Clarius Mobile Health Corp developed the revolutionary Clarius HD3 app-based ultrasounds, a third-generation line of wireless handheld scanners that enable physicians from a wide range of specialties to use ultrasound for fast diagnosis and safe procedures. Clarius wireless scanners connect with Apple and Android devices, which most physicians already carry with them. Clarius sets itself apart from other handheld ultrasound systems with its exceptional imaging quality that rivals expensive cart-based systems, wireless connectivity, and specialty scanners with Software-as-a-Service (SaaS) designed to automatically optimize clarity and workflows for different anatomy and applications.

Clarius HD3 scanners incorporate the latest antenna technology to provide a reliable, direct WI-FI connection to clinicians' Android and iOS devices, enabling users to perform and view ultrasound scans without needing any cables or ports, thus offering a hassle-free experience. Furthermore, these wireless scanners, with dimensions similar to a smartphone and weighing only 290 grams, allow clinicians to take the device to different clinical settings, even in remote locations, and effortlessly perform ultrasound scans at the point of care, thus improving access to ultrasound imaging for underserved patient populations.

Clarius HD3 wireless ultrasound scanners use 192 piezoelectric elements that facilitate scanning to the depth of up to 40 centimeters (cm), which is significantly deeper than competitive handheld ultrasound systems. Unlike commercially available wired handheld ultrasound systems that use only 1 to 2 beamformers, Clarius HD3 wireless scanners incorporate 8 beamformers for increased data processing and frame rates, thus delivering sharper and smoother patient images in the Clarius App and enabling high-definition imaging to facilitate accurate disease diagnoses in patients.

The Clarius scanners are available to clinicians at a substantially lower cost than laptop-based and wired handheld ultrasound systems. Clarius offers a membership bundle starting at $2,995, with an annual membership of $595 that includes access to specialty packages with advanced imaging modes, including elastography for mapping the stiffness and elastic properties of soft tissues, needle visualization of linear scanners, and a pulsed-wave Doppler option to provide clinicians with vital clinical insights, all while allowing clinicians to perform ultrasound scans more affordably.

Having an integrated, quick rechargeable battery in the Clarius HD3 scanners is a critical point of differentiation in the market. The scanners can be fast charged in only 90 minutes and offers up to 60 minutes of scanning time, compared to about 5 hours of recharge time and 50 minutes of scan time for competing products, allowing clinicians to use the device in locations with unreliable power sources. In addition, the use of the Advanced Quad-Liquid-Cooling system and fan prevent the devices from overheating while maintaining imaging and battery performance, even when used for an extended duration of time.

Another factor that sets the Clarius HD3 scanners apart from competing solutions is the ease with which the devices can be disinfected. The scanners are IP67 rated, which means they are completely protected from water ingress, thus allowing the devices to be fully submerged in disinfectants for complete disinfection. Unlike other commercially available products, the scanners are compatible with a broad range of cleaners and disinfectants, including those used in low-level, intermediate, and high-level disinfection, thereby preventing the risk of cross-contamination among patients.

Clinicians can choose from seven ultrasound scanners, each designed to meet the specific requirements of a broad range of medical specialties in hospital settings and beyond to private clinics. The Clarius C3 HD3 multipurpose scanner is intended to perform ultrasound scans of the abdomen, lungs, heart, bladder, and other superficial structures to assess the profiles of the gallbladder, thyroid nodule, fetal heart, and deep vein thrombosis. The scanner is ideally suited for use in specialties such as critical care, emergency medicine, emergency medical services (EMS), general practice, palliative care, internal medicine, and obstetrics and gynecology.

For high-definition musculoskeletal (MSK) imaging, Clarius offers a line of three linear scanners. Anesthesiologists rely on the ultra-portable Clarius L7 HD3 scanner to guide safe, accurate regional blocks up to 11 cm in depth in the pre-op area, operating room, and for post-operative follow-up. The popular Clarius L15 HD3 delivers best-in-class imaging of superficial structures, from small nerves and vessels to musculoskeletal and lung imaging up to 7 cm. The scanner is used in specialties such as orthopedic-surgery to make accurate diagnosis of muscle sprains, tendon tears, and ligament injuries and to safely guide platelet-rich plasma (PRP) injections. The newest Clarius L20 HD3 is the only wireless scanner with ultra-high frequency up to 20 MHz and has rapidly emerged as the ultrasound device of choice for medical aesthetics. The scanner offers exceptional superficial imaging to 4 cm to avoid vascular complications by guiding safe filler injections, confirm filler placement and vessel flow after injections, and to measure dermal thickness prior to microneedling.

Clarius offers a number of additional specialized scanners. The Clarius PA HD3 phase array scanner delivers high-definition echocardiography for rapid bedside cardiac exams - it's ultra-portable for cardiologists to carry between their office practice, on the hospital wards, and in the peri-operative units. The Clarius EC7 HD3 is the world's first high-definition wireless endocavity scanner that is specifically designed for performing early obstetrics, gynecology, in vitro fertilization (IVF), pelvic, and urology examinations. The Clarius C7 HD3 microconvex scanner is purpose-designed for imaging of small parts, and delivers superior superficial imaging for applications like speech therapy and pediatric medicine.

The entire line of seven Clarius HD3 wireless scanners have been approved by the US Food and Drug Administration (FDA) and are currently available for sale in the United States, Canada, Europe, and a number of countries in other regions. Clarius is working with other regulators to launch the device in over 90 countries worldwide.

Enabling Promising Growth through Customer Centricity

Clarius has always been at the forefront of promoting the adoption and use of ultrasound through education, especially for new medical practitioners. With this objective, Clarius launched Clarius Classroom in March 2021 on the Clarius App that features brief video tutorials and pathology interpretation provided for free by expert ultrasound physicians. The short videos contain step-by-step guidance so that users can easily learn and become accustomed to how the Clarius scanners work and how to identify specific abnormalities related to the anatomy to be scanned. Furthermore, Clarius offers live monthly webinars on ultrasound education to improve users' understanding of the practice. With the launch of the new Clarius Membership, members also gain access to monthly live training to learn from experts and hone their ultrasound skills.

Clarius effectively uses ultrasound telemedicine to provide medical practitioners with the ability to guide, monitor, and review ultrasound exams from a distance with colleagues. Using the Clarius Live feature on the Clarius App, members can broadcast live ultrasound imaging to other practitioners of their choice, allowing the latter to view the scans on any standard browser on their smartphones or computers. The recipients can provide real-time touch feedback by highlighting the areas of interest on the live ultrasound image and enter into two-way audio and video communication with the operator. This development can facilitate collaboration among different medical practitioners located thousands of miles apart and open new opportunities for rural medicine and remote education.

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> ***Industry Analyst***

One of the company's key strategies to drive customer acquisition in hospital settings and beyond is deploying innovative technologies, including machine learning (ML) and artificial intelligence (AI), in the Clarius Ultrasound App. By integrating ML and AI, the Clarius Ultrasound App can identify the patient's anatomy at the macro level when the ultrasound is performed using the Clarius C3 HD3 multipurpose or PA HD3 scanners. The ML and AI have been trained using tens of thousands of ultrasound images from the company's database and can thus accurately recognize different structures in the human torso during the scanning process. In addition, these features automatically adjust the settings to optimize the imaging for the area being examined.

Conclusion

Laptop-based ultrasound systems are available at a considerably high price point, while quality of performance and imaging of wired handheld ultrasound systems are not optimal. In addition, the presence of cables in these devices makes the scanning process inconvenient for clinicians.

To overcome these barriers, Clarius developed the line of Clarius HD3 wireless handheld scanners and the Clarius Ultrasound App to deliver an unmatched high-definition ultrasound imaging process and hassle-free experience to clinicians. It has successfully replaced the complex knobs and buttons of traditional portable ultrasound systems with simple pinch and swipe motions on smart devices, delivering high-performance imaging in an easy-to-use solution that is fast gaining traction in hospitals and clinics alike across specialties. The scanner's smaller dimensions and exceptional battery performance carry out point-of-care ultrasound scans in any clinical setting, urban or remote, thus improving access to imaging for underserved patient populations and for new specialty applications.

Frost & Sullivan commends the company's ability to incorporate premium, high-performance ultrasound imaging in a small form factor that is available in an affordable pricing package.

For its strong overall performance, Clarius Mobile Health Corp earns Frost & Sullivan's 2022 North American Technology Innovation Leadership Award in the portable ultrasound industry.

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Award recognizes the company that has introduced the best underlying technology for achieving remarkable product and customer success while driving future business value.

Best Practices Award Analysis

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

About Frost & Sullivan

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The Growth Pipeline Engine™

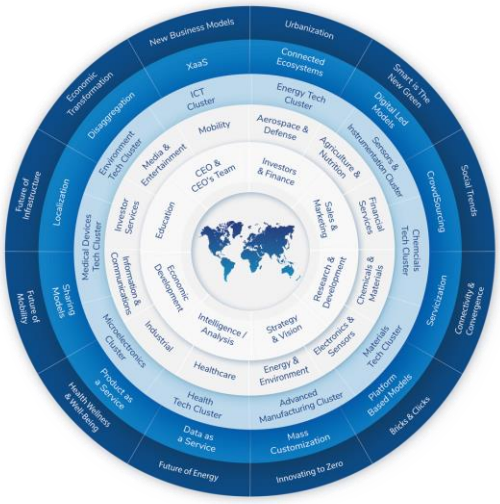
Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.
Learn more.

Key Impacts:

- **Growth Pipeline:** *Continuous Flow of Growth Opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*

The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.



Analytical Perspectives:

- Mega Trend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)