FROST & SULLIVAN

CLEW Medical

2022 TECHNOLOGY INNOVATION LEADER

Global Artificial Intelligence-based Clinical Analytics 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. CLEW Medical excels in many of the criteria in the artificial intelligence-based clinical analytics space.

Artificial Intelligence-based Clinical Analytics: Market Overview

Healthcare businesses must manage, analyze, and interpret data for strategic, tactical, and operational insights to provide high-quality care. The healthcare industry is witnessing a strong adoption of automation and artificial intelligence (AI) predictive algorithms that streamline operations and facilitate preventive rather than reactive care. Further, the COVID-19 pandemic has accelerated the demand for solutions that can remotely cater to large patient populations. Frost & Sullivan expects virtual care to persist, steering the healthcare system towards a hybrid approach.[1] Additionally, research suggests that 72% to 99% of clinical alarms are false, leading to alarm fatigue.[2] In other words, clinicians experience sensory overload due to an excessive number of alarms. Therefore, payers and providers must integrate tailored, cloud-based clinical and value-based care analytics to tackle these challenges.

Complete and personalized client service, interoperability, data availability, and staff relief enable service providers to stand out in the competitive space. CLEW Medical (CLEW) uniquely leverages its technology to meet customer needs. It is well-positioned to capitalize on new growth opportunities, cementing its position in the AI-based clinical analytics market.

[1] *Frost Radar™: Healthcare Data Analytics, 2022,* (Frost & Sullivan, August 2022).
[2] Sue Sendelbach and Marjorie Funk, "Alarm Fatigue: A Patient Safety Concern," AACN Advanced Critical Care 24, no. 4 (October 1, 2013): pp. 378-386, https://doi.org/10.4037/nci.0b013e3182a903f9.

Innovative Technology Revolutionizes the Industry

Founded in 2014 and with offices in USA and Israel CLEW is a provider of real-time healthcare AI analytics platforms that extend ICU capacity by enabling proactive clinical care. The company develops individual patient-level physiological predictive models using machine learning (ML) and data science. By equipping staff with full situational awareness of current and predicted patient conditions across units, care settings, and EMRs, CLEW increases patient flow, reduces the alarm burden, and potentially improves clinical outcomes. With proven success in the intensive care unit (ICU), the models are now being extended to all care settings to help anticipate patients' clinical state. CLEW has the potential to help physicians make better clinical decisions, enhance outcomes and safety, expedite patient care, manage emerging regulations and penalties, reduce care costs, and remove discharge obstacles.

The company understands the various clients' unique needs and has taken steps to provide them with the most up-to-date and cutting-edge solutions. Its orderly and systematic product development journey begins with extensive research and development conducted by tenured industry professionals. CLEW works closely with customers, receiving constant feedback throughout the development process. Then, it leverages this knowledge to build innovative solutions that address market needs.

CLEW's technology uses clinical and patient data to generate reliable predictive clinical analytics. Its analytics engine recognizes – in real time – changes in a patient's condition that may suggest life-threatening situations up to eight hours in advance. Therefore, the predictive model allows clinicians to intervene even before patients develop symptoms, thus functioning proactively rather than reactively. CLEW's technology offers the advantages of scalability, interoperability, robustness, security and privacy, full compliance, and benefits hospital management and medical personnel by delivering the preemptive information they require to better manage their resources.

Case Study

The clinical team at the UMass Memorial Medical Center administered antibiotics and fluids to a patient experiencing breathlessness, fever, and low blood pressure. After a few days, she seemed to recover well, and the clinicians were satisfied with her progress. However, CLEW's solution predicted that the patient was going back into respiratory failure. This unexpected projection spurred clinicians to seek an expert opinion. There was excess fluid in the patient's body, which would trigger breathlessness again. CLEW's technology enabled clinicians to take preemptive actions and prevent the patient from further deterioration.[3]

Solutions

CLEW's Virtual ICU platform leverages technology to streamline workflows and improve communications, decision-making, and care implementation in critical care. The solution enables early identification and intervention, improved case volumes, and patient context prioritization using FDA-cleared predictive models. CLEW interfaces with existing EMR systems and medical devices and can be deployed either on-premises or in the cloud.

[3] Using the Power of AI & Machine Learning to Deliver Meaningful Impact & Improve Patient Value. YouTube, 2019. https://www.youtube.com/watch?v=dN4tAHYL3yk.

CLEW's ICU solution offers centralized patient risk classification, customized real-time clinical optimization, and actionable predictive clinical analytics. The platform utilizes all accessible patient data to make ongoing forecasts using sophisticated ML algorithms and models. The technology prioritizes patient context, enhances case volumes, and enables early identification and intervention. Ensuring the highest patient privacy and data security levels, it interfaces with existing electronic medical record platforms and clinical bedside monitoring equipment. Other benefits include optimal resource management through acuity-based allocation, improving case volumes while reducing workload and burnout.

> *"Frost & Sullivan applauds CLEW for addressing critical market gaps and believes that its groundbreaking technology is revolutionizing the clinical analytics AI space."*
>
> ***- Ojaswi Rana, Best Practices Research Analyst***

CLEW's Virtual **ICU** solution offers dynamic worklist prioritization based on new admissions, tasks, high-risk patients, and CLEW notifications, allowing telemedicine ICU (tele-ICU) personnel to follow high-risk patients, re-prioritize workload, and make acuity-based staffing decisions based on unit-level risk feedback. The Health Insurance Portability and Accountability Act (HIPAA)-compliant cloud-based technology is a fully scalable system for tele-ICU facilities of all sizes and supports rapid deployment.

In February 2021, the company's critical care offering, **CLEWICU**, became the first Food and Drug Administration (FDA)-cleared device to use hemodynamic instability to predict patient health deterioration.[4] With a high positive predictive value, it significantly reduces alert fatigue and provides low-risk patient classification. In other words, in addition to advising caregivers about deteriorating patient health, the solution also alerts hospital staff about the patients that are stable and require less resources. This information significantly reduces the ICU burden and enables effective resource management.

"What's revolutionary about this technology is that it allows us to say with confidence that there isn't going to be any trouble tonight. Improving sleep and the experience in the ICU is one of the great promises of this technology."

- Dr. Craig Lilly, Vice Chair, Critical Care Operations, UMass Memorial Medical Center[5]

Frost & Sullivan applauds CLEW for addressing critical market gaps and believes that its groundbreaking technology is revolutionizing the clinical analytics AI space.

Commercial Success

Since receiving FDA clearance, in 2022, CLEW won a contract with one of the largest tele-ICU providers in the United States (US) delivering tele-ICU services to hospitals and health systems. After going live for about five months, the technology has reported zero downtime and after-hour support calls.[6] This proven success has prompted the tele-ICU provider to add additional customers to the platform. In September 2022, Penn State Health implemented CLEW's platform to offer virtual ICU (vICU). Penn State Health's vICU covers Penn State Health Hershey Medical Center, Penn State St. Joseph's Medical Center, and the

[4] James Spiro, "Clew Medical Receives FDA Approval for AI-Based Tech to Support Adult ICU Patient Assessment," CTech, February 3, 2021, https://www.calcalistech.com/ctech/articles/0,7340,L-3891252,00.html.
[5] Using the Power of AI & Machine Learning to Deliver Meaningful Impact & Improve Patient Value. YouTube, 2019. https://www.youtube.com/watch?v=dN4tAHYL3yk.
[6] Interview with CLEW Medical, 13 September 2022.

new Penn State Health Lancaster Medical Center. Expansion to Penn State Health Holy Spirit Medical Center is planned for early 2023, as is expanding to other hospitals and health systems.

"CLEW's ability to support all major electronic health record (EHR) and patient monitoring platforms means we will be able to easily extend the service to other hospitals and health systems, regardless of their specific configurations."

- Chris LaCoe, Vice President, Virtual Health for Penn State Health[7]

CLEW distinguishes itself from other market participants by actively listening to customer demands, responding to them, and translating new scientific knowledge into clinical practice. Its FDA-approved offering attracts partnerships with EHRs without FDA clearance or tele-ICU capabilities. As a result, the company is closing additional commercial contracts and building commercial teams in the US and Europe to support its growth.

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Frost & Sullivan anticipates rapid, widespread technology adoption of Clew's Tele ICU platform. CLEW's first-mover status strengthens its position on emerging opportunities.

Positioned for Growth

With its customer-led strategy, the company brings a best-in-class AI-based predictive analytics system to the market. At the same time, it incorporates customer feedback into its product roadmap to maximize short-term growth opportunities while providing a path to future revenues. While evolving from a technology standpoint, CLEW never loses sight of its clients' perspectives. The company maintains its US presence while expanding its global footprint and initiating new business in Europe and other international markets

The company recorded significant revenue in its first year of commercialization.[8] It utilizes these revenues to fund expansions and make new investments in marketing and sales. In 2020, it raised $20 million in a Series B round of funding led by Pitango Venture Capital, Israel's largest venture capital fund.[9] A medical device company is a strategic investor in the US. Other investors continue supporting CLEW directly and indirectly, with a large health insurance firm in Europe hiring employees to grow the company's business in the region. In light of this expansion, CLEW's board of directors recently named industry veteran and visionary Paul Roscoe as its new CEO, responsible for leading the growth of CLEW worldwide. Gal Salomon, current CEO and co-founder, will serve as Executive Chairman. Given today's landscape, Frost & Sullivan believes CLEW is in a prime position to increase its market share in this highly competitive AI-based clinical analytics industry.

[7] CLEW Medical, "Penn State Health to Pioneer Next-Generation Virtual ICUs with Clew Medical's AI Powered Cloud-Based Platform," CLEW, September 29, 2022, https://clewmed.com/penn-state-health-to-pioneer-next-generation-virtual-icus-with-clew-medicals-ai-powered-cloud-based-platform/.
[8] Interview with CLEW Medical, 13 September 2022.
[9] Fred Pennic, "Clew Lands $20m to Expand AI-Powered Critical Care Platform in the US Market," Healthcare IT News, January 16, 2020, https://hitconsultant.net/2020/01/16/clew-lands-20m-to-expand-ai-powered-critical-care-platform-in-the-us-market/.

Conclusion

Technology is a critical success factor for the artificial intelligence (AI)-based clinical analytics industry. Yet, with many options available, market stakeholders need to leverage the most appropriate and best technology-based solutions to optimize their market impact. With its technology, CLEW Medical (CLEW) has the potential to help physicians make better clinical decisions, enhance patient outcomes and safety, expedite care, reduce care costs, and remove discharge obstacles. CLEW stands out from competitors based on its commitment to innovation and creativity while achieving commercial success. Demonstrating exceptional commercialization success, the company exhibits immense growth potential globally.

With its strong overall performance, CLEW earns Frost & Sullivan's 2022 Global Technology Innovation Leadership Award in the AI-based clinical analytics 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™.
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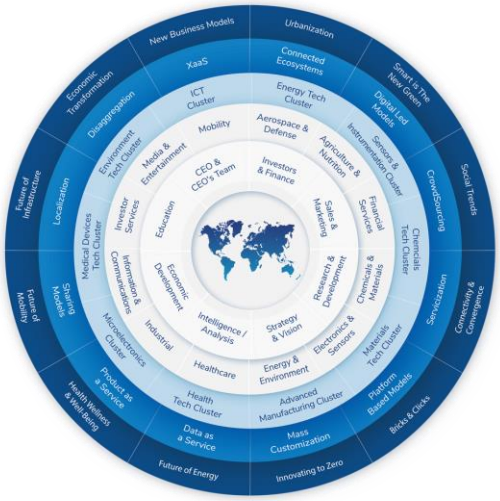
Key Impacts:

- **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)