

FROST & SULLIVAN



POWER
ARENA

2022 COMPETITIVE STRATEGY LEADER

*TAIWAN
COMPUTER VISION IN
MANUFACTURING 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. PowerArena excels in many of the criteria in the computer vision in manufacturing space.

AWARD CRITERIA	
<i>Strategy Innovation</i>	<i>Customer Impact</i>
Strategy Effectiveness	Price/Performance Value
Strategy Execution	Customer Purchase Experience
Competitive Differentiation	Customer Ownership Experience
Executive Team Alignment	Customer Service Experience
Stakeholder Integration	Brand Equity

Market Snapshot

To this end, manufacturers seek to implement smart manufacturing solutions by adding intelligence, interconnectivity, and automation at every step of their operations, including production, supply chain inventory management, and quality control. However, despite the ongoing automation of manufacturing processes, machines cannot yet (and potentially never will) replace humans entirely in these environments due to their inherently limited flexibility, high initial costs, and supply/demand factors. As a result, manufacturing, especially in the Asia-Pacific region, remains a predominantly human-driven

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**- Youngso Lee, Senior Industry Analyst
Global AI Practice**

industry. But the proactive, efficient, and cost-effective management of these labor-intensive operations in increasingly data-driven manufacturing ecosystems remains a critical challenge.

Within this context, computer vision technology that enables machines to ‘see’ the physical world by allowing them to extract, process, and analyze information from visual inputs is emerging as a viable solution for managing manufacturing operations effectively.

Moreover, this technology supports endless use cases (such as vision-guided robots, anomaly detection, defect reduction, packaging inspection, and barcodes and test labels scanning) to enable manufacturers to improve process efficiencies, enhance overall productivity, and drive revenue growth. Though still in the early stages of adoption, computer vision solutions are witnessing growing popularity in the Taiwanese manufacturing sector, evidenced by an increasing number of companies implementing these advanced solutions to drive their manufacturing operations' digital transformation.

Despite these positive prospects, several challenges hinder the widespread adoption of computer vision solutions in the manufacturing sector. Data drift in the continuously changing manufacturing environments and the consequent need to update AI programs makes solution implementation expensive and time-consuming. Moreover, rampant confidentiality and cybersecurity concerns further hinder the computer vision technology uptake. As most contemporary computer vision companies depend on the cloud for data storage and advanced analytics applications, many manufacturers hesitate to deploy these solutions at their manufacturing sites due to compliance and security threat issues. Therefore, the market is ready for innovative providers that offer proven technological solutions that deliver the promised results in a secure environment.

Founded in 2018 at Stanford Incubator StartX, Taipei, Taiwan-headquartered PowerArena offers a game-changing computer vision-based product that helps manufacturers enhance standard operating procedure (SOP) compliance and eliminate bottlenecks by enabling the intelligent monitoring and remote control of their assembly lines. In 2019, the company launched its powerful video analytics platform that incorporates deep learning (DL) and machine learning (ML) to optimize manufacturing operations. PowerArena operates out of Taiwan, China, Hong Kong, and the United States (US), deploying its computer vision solutions in six countries with three out of the top five global electronics manufacturing services (EMS) enterprises among its growing customer base.

Competitive Edge through Unique Strategies

PowerArena's primary mission is to leverage computer vision technology to enhance human performance in manufacturing operations, identifying and fulfilling existing and emerging customer needs. Founded and operated by experienced technology experts, PowerArena combines computer vision and ML with time/motion study and lean six sigma principles to digitalize physical manufacturing environments. The company's powerful platform collects shop floor data from pre-installed off-the-shelf cameras and applies DL- and ML-powered video analytics to generate real-time actionable insights into its customers' on-site operations at a granular level. Ongoing efforts on continual product enhancements, strategic partnerships for geographic expansion, and competitive capability additions continue to expand PowerArena's computer vision-based video analytics solution. In 2021, the company further strengthened its value proposition and commitment to improving its manufacturing customers' process efficiencies, operational productivity, and overall profitability.

PowerArena taps into the Taiwanese manufacturing sector's growth opportunities with its competitive computer vision platform. The company consistently expands its business case through continual platform enhancements. Initially supporting only line balancing applications, PowerArena added SOP assistance capability to its platform in 2021 and plans to launch the downtime analysis feature in 2022. As a result, the company's platform will drive three robust use cases;

- **Line balancing:** Utilizes workflow metrics that visualize the factory floor to identify opaque and complex bottlenecks to streamline workflow productivity and strengthen teamwork. For instance, a global top 5 EMS company adopted PowerArena's line balancing solutions across its production lines to identify existing bottlenecks by utilizing real-time data of labor-intensive activities. As a result, the customer successfully implemented an improvement plan to increase the manufacturing site's overall productivity, recording an impressive 5.2% unit produced per hour improvement and over 5X return on investment within four weeks (as determined by PowerArena's internal observations). This performance improvement is particularly significant in the manufacturing sector as companies already run optimized operations on very tight margins. Additionally, access to unbiased and continuous shop-floor data ensures that the customer is well-equipped to promptly and efficiently solve any future bottlenecks.¹
- **SOP assistance:** Upholds SOP compliance using customizable software that detects and alerts factory workers about skipped steps and informs management regarding overall performance, thereby ensuring the desired quality is maintained throughout the customers' manufacturing operations.
- **Downtime analysis:** Reduces downtime by monitoring the interaction between workers and equipment to detect long delays and assisting in root cause analysis, ultimately improving the manufacturing sites' overall equipment effectiveness. This capability will be particularly pertinent in driving PowerArena's penetration into the US market by serving the specific needs of the heavily machine-dependent regional customers.

PowerArena's Build Your Own AI (BYOAI) is another example of a competitive offering that helps the company strategically address dynamic customer requirements. BYOAI is a no-code solution that addresses the data drift-related time and cost challenges by enabling the customers' in-house industrial engineers to train the AI without extensive coding knowledge. As a result, customers save significantly on time and costs otherwise incurred from hiring external engineers to update the solutions periodically.

Moreover, PowerArena alleviates its customers' cybersecurity concerns with its ready-to-go platform with applications pre-loaded on a secure, optimized, high-power, and on-premise server. Additionally, PowerArena does not capture facial images, protecting the factory workers' privacy. Furthermore, the company's end-to-end solutions give its customers complete control over the entire solution implementation and operation process, from setting up computer vision applications in production lines and creating an interactive dashboard to receiving alerts and performing root cause analysis. This control eliminates external interference ensuring secure operations at all times.

¹ <https://www.powerarena.com/success-stories/success-story-tackle-bottleneck-line-balancing-global-top-5-ems-company/>, accessed April 2022.

With its advanced computer vision technology in place, PowerArena continues to expand its geographical footprint and market presence through strategic partnerships with key industry participants. The company growing partner ecosystem consists of international companies and local system integrators in Taiwan and China, including NTT Data, AXIS Communications, Advantech, and ADLINK. For example, PowerArena recently collaborated with NTT Data to help Taiwanese electric motorbike manufacturer Gogoro further enhance the performance of its advanced Taiwanese manufacturing line. The customer leverages PowerArena's SOP assistance capability to perform real-time process quality checks, ensuring high-quality and efficient operations. Upon validating PowerArena's solution in its domestic manufacturing line, Gogoro plans to transplant this technology/system to its new manufacturing facilities in China, India, and Indonesia in 2022.² Moreover, as Gogoro is a leading adopter of smart manufacturing solutions across its entirely in-house manufacturing operations, PowerArena's success in acquiring this customer is a testament to its computer vision solution's technological competitiveness.

Frost & Sullivan believes PowerArena is well prepared for today's demands and strategically positioned for tomorrow's needs. The company's clear strategic vision and execution underpin its partner of choice status and sustainable growth for years to come.

Roadmap to Success: Customer-centric, Continuous, Proactive

PowerArena serves clients across the manufacturing sector, including several Fortune 500-manufacturers, such as Wistron, JABIL, MSI, ASM, LITEON, Gogoro, Gudeng, and TAL Apparel. The company helps more than 12 customers in six countries with a 30+ employee team, including two industrial engineers with extensive manufacturing expertise. To meet varying customer needs, PowerArena offers its solutions as integrated software packages consisting of edge servers with yearly maintenance. Moreover, the company provides exceptional 24/7 customer service through its dedicated team of client success experts that support customers with a rigorous onboarding program and continual operational support. For instance, during the first 12 weeks, PowerArena works closely with new customers to set up servers, deploy the AI platform, and review accumulated data bi-weekly to improve process efficiency. Moreover, the company's in-house team and its certified partners provide comprehensive, personalized support for customers on an ongoing basis. Furthermore, PowerArena offers customers essential resources, including blogs, newsletters, webinars, whitepapers, training, and certification enabling clients to optimize the production processes.

PowerArena uses client feedback combined with industry trend monitoring to guide its product roadmap and continuously evolve its computer vision-powered platform to maintain its innovative edge. Furthermore, the company conducts regular client surveys to ensure high customer satisfaction, earning it an excellent reputation and exceptional client success rates.

The demand for computer vision solutions continues to increase with the growing customer awareness regarding the viability of these technologies to address the manufacturing sector's prevalent challenges. Within this context, PowerArena, with its proven technology, customer-centric approach, and established market presence, is well-positioned to capitalize on this increasing demand.

² <https://www.powerarena.com/news/gogoro-employs-smart-manufacturing-solutions-to-burgeoning-business-development-in-china-india-indonesia/>, accessed April 2022.

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*- Sama Suwal,
Best Practices Research Analyst*

As a result, PowerArena continues to drive favorable financial success in the Taiwanese market, projecting a minimum of 2X growth in 2022. Moreover, PowerArena will enter new markets in India and Indonesia this year with aspirations to expand into Mexico and Southeast Asia in the coming years.

Frost & Sullivan believes the company is well-positioned to drive computer vision in manufacturing space into its next growth phase, capturing market share and sustaining its growth trajectory in the coming years.

Conclusion

Frost & Sullivan believes that innovation and growth opportunities drive future success; many factors contribute, yet having a competitive strategy is critical. PowerArena understands this core concept and is driving the adoption of computer vision technology in the manufacturing sector with its focused product development, strategic partnerships, and competitive capability additions, helping it to outpace competitors. The company consistently expands its business case through continual platform enhancements. Initially supporting only line balancing applications, PowerArena added SOP assistance capability to its platform in 2021 and plans to launch the downtime analysis feature in 2022. Moreover, PowerArena’s Build Your Own AI is another competitive offering that helps the company strategically address dynamic customer requirements. Furthermore, the company continues to expand its geographical footprint and market presence through strategic partnerships with key industry participants. Overall, PowerArena develops and implements its strategies with its manufacturing customers in mind, securing its position as a trusted partner in the market.

With its strong overall performance, PowerArena earns Frost & Sullivan’s 2022 Taiwan Competitive Strategy Leadership Award in the computer vision in manufacturing industry.

What You Need to Know about the Competitive Strategy Leadership Recognition

Frost & Sullivan's Competitive Strategy Leadership Award recognizes the company with a stand-out approach to achieving top-line growth and a superior customer experience.

Best Practices Award Analysis

For the Competitive Strategy Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Strategy Innovation

Strategy Effectiveness: Effective strategy balances short-term performance needs with long-term aspirations and overall company vision

Strategy Execution: Company strategy utilizes Best Practices to support consistent and efficient processes

Competitive Differentiation: Solutions or products articulate and display unique competitive advantages

Executive Team Alignment: Executive team focuses on staying ahead of key competitors via a unified execution of its organization's mission, vision, and strategy

Stakeholder Integration: Company strategy reflects the needs or circumstances of all industry stakeholders, including competitors, customers, investors, and employees

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

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)**

