

F R O S T & S U L L I V A N

2024

**ENTREPRENEURIAL
COMPANY OF THE YEAR**

*IN THE GLOBAL
INDUSTRIAL AI FOR
HEAVY INDUSTRY*

F R O S T & S U L L I V A N

2024 BEST
PRACTICES
AWARD

VIVITY AI

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. Vivity excels in many of the criteria in the industrial AI space.

| AWARD CRITERIA | |
|-----------------------------------|-------------------------------|
| <i>Entrepreneurial Innovation</i> | <i>Customer Impact</i> |
| Market Disruption | Price/Performance Value |
| Competitive Differentiation | Customer Purchase Experience |
| Market Gaps | Customer Ownership Experience |
| Leadership Focus | Customer Service Experience |
| Passionate Persistence | Brand Equity |

Market Disruption

In heavy industry, challenges related to workforce, dataflow, workflow, and operations impacted by environmental factors are much more magnified than they are in the more automated side of manufacturing. These challenges lead to many inefficiencies and risk mismanagement. For instance, heavy industry sectors involve specialized, highly technical jobs, such as shipbuilding, that face skilled-labor shortages and a lack of knowledge transfer. When it comes to dataflow, most heavy industry companies, even big enterprises, still use Excel software for planning, and therefore gaps arise between what is really happening and what is reported.

In semiconductor and automotive manufacturing, line/serial processes are sequential and automated, involving production flow from one station to the next, whereas heavy industry involves parallel processes, which are hard to effectively control and thus contribute to workflow challenges. In addition, some processes in heavy industries are not fully automated and may not be for some time. For example, shipbuilding and heavy manufacturing involve interaction between people and machinery, which creates a lot of asymmetries and inefficiencies. And because of the operational challenges brought on by environmental factors, heavy equipment manufacturers face productivity losses when workers struggle with health and safety issues, such as the summer heat (in work environments without air conditioning). Ultimately, the digital–physical gap in heavy industry leads to inefficiencies and risk mismanagement that industrial artificial intelligence (AI) can help address.

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- Sankara Narayanan
-Industry Director

To bridge this gap, Vivity AI Inc. developed an end-to-end AI platform. The company built its product line on 3 pillars: Vivity Edge to identify and track processes, Vivity Analytics to analyze data and obtain actionable insights, and Vivity Studio to manage and operate AI.

Vivity Edge: Many traditional heavy industry organizations think in terms of hardware and are not used to procuring software, so they are way behind businesses in the more established and cutting-edge manufacturing industries. They neither want nor are ready for fancy analytics platforms. To this end, edge computing is how Vivity serves these enterprises and delivers them immediate value. Vivity Edge is an edge computing platform for on-the-spot decisions in the operational domain. While Vivity’s fundamental technology is computer vision-based, it employs a lot

of foundational technologies that are best in class. For instance, in workplace safety, Vivity is working on its next-level product, which leverages large language models (LLM) to let people query. For example, users can ask questions such as “In the last 24 hours, has a safety violation occurred in this area of the floor?”

Vivity Analytics: For AI-driven multi-dimensional insights through advanced analytics, Vivity unifies all the data on the platform’s analytics side, where it has a lot of the more sophisticated modeling for situational awareness and better decision-making. The technologies powering Vivity Analytics are quality of work estimator, virtual situation room for manufacturing insights, video intelligence analyzer, and rapid task optimizer for in-depth analysis and planning.

Vivity Studio: Vivity Studio is Vivity’s machine learning operations (MLOps) pipeline focused on foundation models tuned for heavy industry use cases and for quick deployment, which is useful for both Vivity and its customers.

Overall, Vivity offers incremental steps—from Edge to Analytics to Studio. Once customers are ready to set up their own data science or AI team, Vivity helps them proceed. Focused on heavy industry customers, Vivity has found a blue space opportunity where it leverages AI to help transform this sector.

Market Gaps and Competitive Differentiation

Many industrial AI companies focus exclusively on automotive or semiconductor manufacturing, but Vivity did not want to enter these crowded sectors; heavy industry, in contrast, has a lot of use cases and is not a well-covered area from an AI perspective.

General-purpose MLOps or out-of-the-box AI platforms designed for the manufacturing sector cannot solve the kind of problems that heavy industries face. Here is where Vivity excels. The company has built its AI platform from the ground up for particular verticals of heavy industry, making many of the technologies’ core features competitive differentiators, including extreme video stabilization, multi-

modal response, smart and dynamic ROI computation, operation condition identification, and hyper-feature detection. For example, in heavy industry, the environment is often harsh, so Vivity built multiple algorithms in extreme video stabilization that work in different conditions, such as sunlight, shade, and extreme vibration. In shipbuilding, several blocks go through different processes, including blasting, painting, reconfiguring, and joining. To optimize the workflow among different factories, shipbuilders use Excel or some sort of optimizer software, which are not sophisticated enough to incorporate all constraints or run numerous scenarios. Using Vivity's rapid task optimizer, shipbuilders can run a lot of different scenarios in about 5 to 10 minutes and optimize all tasks—as a result, the throughput is almost 40% higher.

Yet another differentiator is that Vivity Edge is lightweight and focuses on point use cases initially so that customers can quickly deploy it in a few months without having to set up a whole data collection pipeline. Vivity Edge provides highly reliable failure detection with a low false alarm rate and cost-effective deployment, whereas Vivity Analytics comes with state-of-the-art generative AI and LLM.

Not only does Vivity offer AI products that are industry-specific, its data expertise is also in heavy industry. For example, the built-in data quality analyzer of Vivity Analytics relies on understanding the heavy industry's metal working processes.

Leadership Focus and Passionate Persistence

With its headquarters in San Francisco, California, US, Vivity's Asian operations are based out of South Korea, which is well known as a manufacturing base and where pretty much anything to do with heavy industry is available. For instance, Koreans are the leading shipbuilders in the world and manufacture a lot of specialized equipment and machinery. Therefore, the country is a great place for Vivity to leverage

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- Sankara Narayanan
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its connections and expertise as well as create good reference cases and develop its AI technology for heavy industry. The company is now expanding globally, landing customers in regions such as Southeast Asia, the Middle East, and the United States, as heavy industry customers span geographies yet work similarly around the world.

Vivity has more than 30 team members, most of which are technical (engineers), and is currently hiring more engineers and resources to support its sales and operations. In the United States, Vivity plans to grow its research and development (R&D) unit as well as hire a head of sales to lead the company and develop the product. The organizational structure at Vivity has two sides. One side has a fairly large computer vision team (i.e., vision and sensor technology) with staff from leading companies such as Cognex and Samsung. A lot of the technologies from this side, especially the proprietary ones (e.g., computer vision-based) that it

developed in a little less than two years, are horizontally applicable in areas such as construction and potentially logistics. On the other side is the data science team that works more so on predictive analytics. The idea is that Vivity can combine different signals. For instance, vision is also a way to look into the world and gather data, and organizations already have a lot of data through industrial operational technology (OT) systems such as PLCs and IoT sensors. To this end, Vivity essentially gets a whole map of the factory floor, and all the collected data is then fed to Vivity's data science team, which can start to do quality tracking, optimization, and so on, in terms of both product quality and workflow.

Vivity entered the scene in June 2022, but it has grown a lot since then. In its first full year of operation alone, Vivity secured four large enterprise clients and raised about \$8 million from Hanwha Systems, a major global corporation, strategic investor, and seventh-largest group in South Korea.

In 2024, the company is well on its way to raise more funding, grow its team size to 50, increase bookings by 8 to 10 times, and bring the total number of clients to 20.

Overall, Vivity's vision is coherent and supported by a highly scalable industry approach. Once its product matures, Vivity could become the AI platform of choice for heavy industry worldwide.

Customer Ownership and Purchase Experience

Frost & Sullivan is impressed by Vivity's streamlined pipeline for implementing its Edge, Analytics, and Studio tools that take customers through a seamless AI adoption journey. It can quickly train models for new use cases, a lot of which are pre-tuned so require minimal data for particular situations. For example, it developed a crane safety system within two weeks; of course, it takes much longer to deploy the system in the field for hardware integration, debugging, and testing.

From cloud and micro-servers to on-premises deployment, Vivity offers a wide range of customizable options to meet its customers' various infrastructure needs. For instance, it can deploy Vivity Edge across a broad scope of hardware. Its customers stem from precision manufacturing (heavy product manufacturing), petrochemical plants and energy, shipbuilding and marine engineering, and construction. Having built the whole stack for heavy industries and their use cases (e.g., equipment failure detection, environmental analytics, erection process analysis, and task distribution optimization) customer need drives the feature set for each application.

Vivity Edge is the company's most mature product in terms of having a number of use cases for enhanced operational efficiency. Vivity Edge includes various task-oriented, domain-specific AI modules that customers can select, such as workplace safety, critical equipment monitoring, block identification, and environmental monitoring. For example, a shipbuilding and marine engineering company deployed Vivity Edge and Vivity Analytics in more than 3 sites for erection process analysis, automated draft analysis, task distribution optimization, and drone image-based block identification. The company moved from manually reported operational planning and job scheduling to drone-based image analysis and sensor technology that now enable real-time awareness and advanced ML-driven scheduling optimization.

Conclusion

Heavy industry customers need AI platforms that bridge the digital–physical gap, and Vivity successfully delivers them. The company’s products and data expertise are specific to heavy industry: Vivity Edge, Vivity Analytics, and Vivity Studio solve workforce, dataflow, workflow, and environmental challenges that if left unaddressed lead to inefficiencies and risk mismanagement.

Unlike general-purpose MLOps or AI platforms, the beauty of Vivity’s AI platform and supporting solutions is that they are dedicated to and designed specifically for heavy industry. Chief among the core features are video stabilization, multi-modal response, smart and dynamic ROI computation, operation condition identification, and hyper-feature detection. A streamlined pipeline for implementation; a wide range of customizable deployment options; and task-oriented, domain-specific AI modules and user-driven use cases enhance Vivity’s customer value proposition. The company has grown significantly in the last 18 months and continues to expand globally on its way to become the AI platform of choice for heavy industry customers. Vivity earns Frost & Sullivan’s 2024 Global Entrepreneurial Company of the Year Award for its strong overall performance in the industrial AI for heavy industry space.

What You Need to Know about the Entrepreneurial Company of the Year Recognition

Frost & Sullivan's Entrepreneurial Company of the Year Award recognizes the best up-and-coming, potentially disruptive market participant.

Best Practices Award Analysis

For the Entrepreneurial Company of the Year Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Entrepreneurial Innovation

Market Disruption: Innovative new solutions have a genuine potential to disrupt the market, render current solutions obsolete, and shake up competition

Competitive Differentiation: Strong competitive market differentiators created through a deep understanding of current and emerging competition

Market Gaps: Solution satisfies the needs and opportunities that exist between customers' desired outcomes and their current market solutions

Leadership Focus: Company focuses on building a leadership position in core markets and on creating stiff barriers to entry for new competitors

Passionate Persistence: Tenacity enables the pursuit and achievement of seemingly insurmountable industry obstacles

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

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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)**

