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BEST PRACTICES

AWARDS

FROST & SULLIVAN

2020 BEST PRACTICES AWARD

VIDA®

2020 GLOBAL
RADIOLOGY AI FOR LUNG CARE
COMPANY OF THE YEAR AWARD

Contents

Background and Company Performance

Industry Challenges

Lungs are complex organs, and various respiratory conditions can affect their functioning. Symptoms such as shortness of breath, for instance, might point to an ordinary chest infection or be attributed to aging, but could likewise result from complex disease conditions. Pulmonologists generally have difficulties in efficiently diagnosing non-infectious conditions, such as interstitial lung disease (ILD) and chronic obstructive pulmonary disease (COPD). With ILD, the etiology involves a collection of over 200 disease types[1], which makes it difficult to pinpoint a diagnosis, often leaving it misdiagnosed as asthma, pneumonia, or bronchitis[2]. For a majority of patients, the correct diagnosis of ILD is made after a year since initial consultation (or over three years, for some), and most are advised to undergo an invasive diagnostic procedure[3] to confirm the diagnosis. COPD patients suffer from similar challenges, with the condition being frequently misdiagnosed as asthma[4]. Given that a misdiagnosis is likely to lead to incorrect treatment, even monitoring disease progression remains a challenge for pulmonologists.

Computed tomography (CT) medical imaging remains a major diagnostic tool for better understanding disease etiology, and therefore aids in diagnosis and characterization of many respiratory conditions in addition to lung cancer. However, diagnosis remains susceptible to intra- and inter-observer variability, meaning that diagnosis or determination of disease severity is subject to interpretation by different specialists, or even variations coming from the same specialist when diagnosed at different points in time. Quantification and detection methods, therefore, need to be objective, preferably automated to help in earlier diagnosis and better monitoring of disease progression. Radiology artificial intelligence (AI) solutions have emerged to solve this challenge in multiple disease areas.

Since the advent of AI solutions in radiology, the majority of startups in the area of solutions for lung care have focused on cancer as the target disease. This choice is justified considering lung cancer's five-year global prevalence is about 2 million patients, with about just as many new cases identified each year and about 1.76 million deaths annually.[5] However, other respiratory conditions could benefit from advanced solutions to address their unmet needs, such as ILD and COPD. There are but a handful of AI solutions to serve pulmonologists in managing patients living with these respiratory conditions, and most are point solutions alone that do not necessarily cover the entire spectrum of care required. Nonetheless, both ILD and COPD are high-impact diseases. For example, COPD

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[1] Source: https://www.thoracic.org/patients/patient-resources/breathing-in-america/resources/chapter-10-interstitial-lung-disease.pdf

[2] Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5773175/

[3] Barriers to timely diagnosis of interstitial lung disease in the real world: the INTENSITY survey. Cosgrove, G.P., Bianchi, P., Danese, S. et al. BMC Pulm Med 18, 9 (2018) doi:10.1186/s12890-017-0560-x

[4] Source: https://www.ncbi.nlm.nih.gov/pubmed/16448970

[5] GLOBOCAN 2018, World Health Organization.

affects 251 million people globally, compromising their quality of life and resulting in 3.17 million deaths.[6] ILD, on the other hand, is a heterogeneous disease that remains complex to diagnose, and therefore the actual incidence and prevalence data remain unknown. Annual incidence estimates for Europe and North America vary from 2.8 to 19 cases per 100,000 people.[7]

Naturally, any AI solution that helps in early diagnosis of COPD and ILD, both of which remain incurable, would offer better ways to manage the patients' condition and support an improved quality of life. Furthermore, there is a high degree of comorbid disease among lung disease patients; therefore, a comprehensive approach to lung disease assessment is essential to uniquely assess each patient.

Visionary Innovation and Performance/Customer Impact

VIDA Diagnostics, Inc. (VIDA) of Iowa, US, was established in 2004 to solve lung disease diagnosis and management challenges. Focused on chest CT imaging for lung diseases, VIDA's AI solutions are transforming respiratory disease care globally.

Addressing Unmet Needs

VIDA is one of a handful of startups that focus on extending pulmonary solutions beyond lung cancer. While many of its peers were founded after 2010, VIDA had the visionary approach to address this unmet need in 2004, thus gaining a significant head start and the advantage of building a vast machine learning training dataset in the quest for the optimal solution. Today, VIDA has fully automated AI solutions for emphysema and COPD, ILD, and airway analysis. These solutions are packaged together in its offering, LungPrint Discovery, and available on a variety of radiology platforms, including Blackford, IBM Watson Health, Nuance and TeraRecon. In addition to Discovery, the company offers a family of products under the LungPrint brand. LungPrint Insights help match patients with therapy selection for lung volume reduction and lung cancer resection. Finally, LungPrint Assist delivers procedural planning and support for lung volume reduction and lung cancer bronchoscopy biopsy procedures.

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[6] World Health Organization. Accessed 20th January 2020, https://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd).
[7] The epidemiology of idiopathic pulmonary fibrosis and interstitial lung diseases at risk of a progressive-fibrosing phenotype. Amy L. Olson, Alex H. Gifford, Naohiko Inase, Evans R. Fernández Pérez, Takafumi Suda. European Respiratory Review 2018 27: 180077; DOI: 10.1183/16000617.0077-2018

In line with modern trends for personalized medicine, VIDA is upgrading its solutions to offer a more customized assessment of each patient's condition in support of better diagnosis and treatment selection. While the Insight and Assist solutions offer a personalized approach, VIDA is enhancing its LungPrint Discovery solution for COPD and ILD to provide personalized reports that make the diagnoses more precise, especially considering the complex nature of these respiratory conditions.

Frost & Sullivan lauds VIDA's visionary foresight in identifying the complex challenges associated with lung disorders and in developing AI-assisted solutions that address several of those challenges effectively.

Significant Competitive Advantage

VIDA's LungPrint Discovery has several competitors, but each of those solutions focus only on a subset of areas that LungPrint tackles. While the majority of them provide a solution for nodule detection (lung cancer), only four competitors offer a solution for emphysema; only two offer a competing solution for ILD; and no competitor can provide airway analysis. Amongst these, only one solution for emphysema has actual regulatory clearance, setting VIDA miles ahead of its competition. In fact, VIDA's LungPrint Solution Suite has regulatory clearances in the United States, Canada, Europe, and Australia, and is already commercialized in all of those regions.

LungPrint offers an array of analyses and novel visualizations including airway and trachea analysis, low and high density analysis (by lobe) for emphysema and interstitial lung abnormality assessment and a image scan quality check. A true highlight of the product is a novel patent-pending airway visualization called Hyperion View, which is a topographic MPR (t-MPR) technique designed to accelerate chest CT interpretation by providing a rapid, global impression of the airways without losing context or resolution to the surrounding tissue. This feature presents an impressive number of non-overlapping airways in a single view. VIDA also offers dynamic air trapping analysis and texture analysis (for research). In comparison, the closest competitor offers an FDA-cleared lung density solution that provides only low density quantification (by lung zones versus anatomically by lobe) and air trapping analysis and ILD texture analysis. The remaining competitors offer only low-density quantification support. While this puts VIDA at a significant competitive advantage over other AI solutions, the company still faces indirect competition from the traditional visual reading approach performed by radiologists themselves. However, as pointed out earlier, manual reads are subject to intra- and inter-observer variability, and tend to lead to radiologist burnout over time due to the unceasing volume of images to review. VIDA's AI solution streamlines the radiologist workflow by providing quantitative insights as a second reader to increase efficiency and reduce fatigue.

Frost & Sullivan commends VIDA for building and maintaining a significant competitive barrier, keeping competition at bay with its forward-thinking strategies and vision.

Patient Pathway-centric Approach

VIDA's solutions are intended for adoption by both radiologists and pulmonary clinicians who can use the reports to help make diagnoses and treatment selections. This application reach is central to VIDA's approach of offering solutions along the patient pathway — from diagnosis, to treatment decision support, to actual procedural support. The LungPrint Discovery solution is well aligned for COPD and ILD detection and quantification. The Insight and Assist solutions help with treatment selection and procedural support, respectively.

VIDA targets its solutions towards earlier detection and diagnosis of these conditions, aligned to earlier interventions that may help halt their progression and improve patients' quality of life. This evolved thinking exemplifies a mature startup in this space, whereas the competition remains focused on detection and diagnosis alone.

VIDA also sees its technologies as enablers of collaboration among radiologists, pulmonary clinicians and patients. The company believes its precise quantitative results and unique visualizations will enhance care team communications in addition to treatment plans.

Frost & Sullivan applauds VIDA's approach of aligning its vision with the current and emerging needs of the industry by designing personalized solutions that address each stage of the patient care pathway.

Differentiated Value Offering

VIDA offers Hyperion View as part of the LungPrint Discovery solution. Using a patent-pending technique, Hyperion View projects many non-overlapping airways onto a single image to provide a single airway view at high resolution for improving the read efficiency and assessment of the disease. It is just one example of how VIDA's solution improves workflow efficiencies for radiologists. A pilot study has demonstrated 16% reduction in interpretation time for a chest CT, and a 35% overall reduction for the lung portion of the chest CT.

VIDA has made its solution available through multiple channels for radiologist customers: one through direct sales and the other through the AI marketplace model. VIDA is listed on all of the incumbent and new marketplaces where subscribing radiologists can access its solutions (i.e., Blackford Analysis, EnvoyAI, Nuance Communications, and IBM Watson Health's Imaging AI marketplace). It is worth noting that some of these marketplace vendors require severe vetting and validation of a solution before they will list it on their marketplace — VIDA is listed and featured in all available marketplaces.

Not only are VIDA's solutions highly useful for radiologists in the clinical setting, they are also extremely helpful for radiologists and pulmonologists performing clinical trials. VIDA offers clinical trial services for medical device and pharmaceutical vendors. As testament to its success, VIDA has completed over 60 clinical trials in 30 countries, resulting in over 200 peer-reviewed scientific publications supporting its solutions' superiority.

Frost & Sullivan believes VIDA's approach to the market provides the most value to all customers, irrespective of their focus on research or clinical applications.

Conclusion

VIDA's solutions cover detection of a variety of lung diseases, providing a comprehensive assessment of the lung as opposed to a single disease solution. VIDA benefits significantly from its tenure in the industry in providing competitively advanced solutions that are also regulatory cleared in the US, EU, Australia and Canada. Taking a patient-pathway-centric approach, VIDA has focused on providing personalized care solutions that can help pulmonologists identify specific disease phenotypes as well as decide on the most appropriate treatments for their patients. Adding value for clinicians and clinical trial sponsors alike, VIDA delivers efficiency and time savings with the promise of early detection and better outcomes for lung disease management.

Based on its strong overall performance, VIDA has earned Frost & Sullivan's 2020 Company of the Year Award.

Significance of Company of the Year

To receive the Company of the Year Award (i.e., to be recognized as a leader not only in your industry, but among non-industry peers) requires a company to demonstrate excellence in growth, innovation, and leadership. This excellence typically translates into superior performance in three key areas—demand generation, brand development, and competitive positioning—that serve as the foundation of a company's future success and prepare it to deliver on the 2 factors that define the Company of the Year Award: Visionary Innovation and Performance, and Customer Impact).

- Acquire competitors' customers
- Increase renewal rates
- Increase upsell rates
- Build a reputation for value
- Increase market penetration

- Earn customer loyalty
- Foster strong corporate identity
- Improve brand recall
- Inspire customers
- Build a reputation for creativity

DEMAND

BRAND

Company of the Year

COMPETITIVE POSITIONING

- Stake out a unique market position
- Promise superior value to customers
- Implement strategy successfully
- Deliver on the promised value proposition
- Balance price and value

Understanding Company of the Year

Driving demand, brand strength, and competitive differentiation all play critical roles in delivering unique value to customers. This three-fold focus, however, must ideally be complemented by an equally rigorous focus on Visionary Innovation and Performance to enhance Customer Impact.

Key Benchmarking Criteria

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated each factor according to the criteria identified below.

Visionary Innovation and Performance

      Criterion 1: Addressing Unmet Needs

      Criterion 2: Visionary Scenarios through Mega Trends

      Criterion 3: Implementation of Best Practices

      Criterion 4: Blue Ocean Strategy

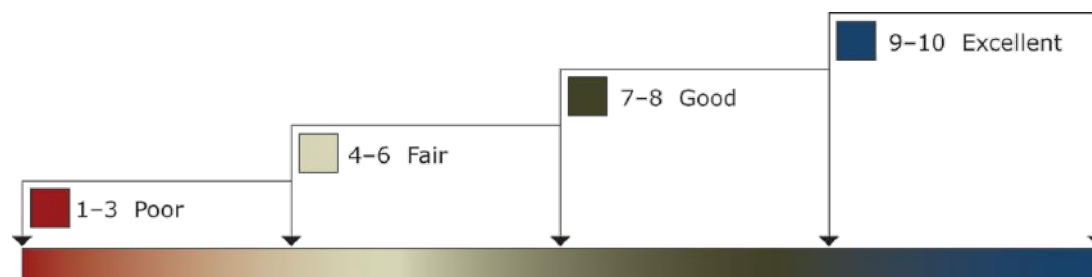   Criterion 5: Financial Performance

Customer Impact

      Criterion 1: Price/Performance Value

      Criterion 2: Customer Purchase Experience

      Criterion 3: Customer Ownership Experience

      Criterion 4: Customer Service Experience

      Criterion 5: Brand Equity

Best Practices Award Analysis for VIDA

Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows research and consulting teams to objectively analyze performance according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation. Ratings guidelines are illustrated below.

RATINGS GUIDELINES

9–10 Excellent
7–8 Good
4–6 Fair
1–3 Poor

The Decision Support Scorecard considers Visionary Innovation and Performance and Customer Impact (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criterion are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, Frost & Sullivan has chosen to refer to the other key participants as Competitor 1 and Competitor 2.

Measurement of 1–10 (1 = poor; 10 = excellent)			
Company of the Year	Visionary Innovation & Performance	Customer Impact	**Average Rating**
VIDA	**9**	**9**	**9**
Competitor 1	8	7	7.5
Competitor 2	7	5	6

Visionary Innovation & Performance

Criterion 1: Addressing Unmet Needs
Requirement: Implementing a robust process to continuously unearth customers' unmet or underserved needs, and creating the products or solutions to address them effectively.

Criterion 2: Visionary Scenarios through Mega Trends
Requirement: Incorporating long-range, macro-level scenarios into the innovation strategy, thereby enabling first-to-market growth opportunity solutions.

Criterion 3: Implementation of Best Practices
Requirement: Best-in-class strategy implementation characterized by processes, tools, or activities that generate a consistent and repeatable level of success.

Criterion 4: Blue Ocean Strategy
Requirement: Strategic focus on creating a leadership position in a potentially uncontested market space, manifested by stiff barriers to entry for competitors.

Criterion 5: Financial Performance
Requirement: Strong overall business performance in terms of revenue, revenue growth, operating margin, and other key financial metrics.

Customer Impact

Criterion 1: Price/Performance Value
Requirement: Products or services offer the best value for the price compared to similar offerings in the market.

Criterion 2: Customer Purchase Experience
Requirement: Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.

Criterion 3: Customer Ownership Experience
Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.
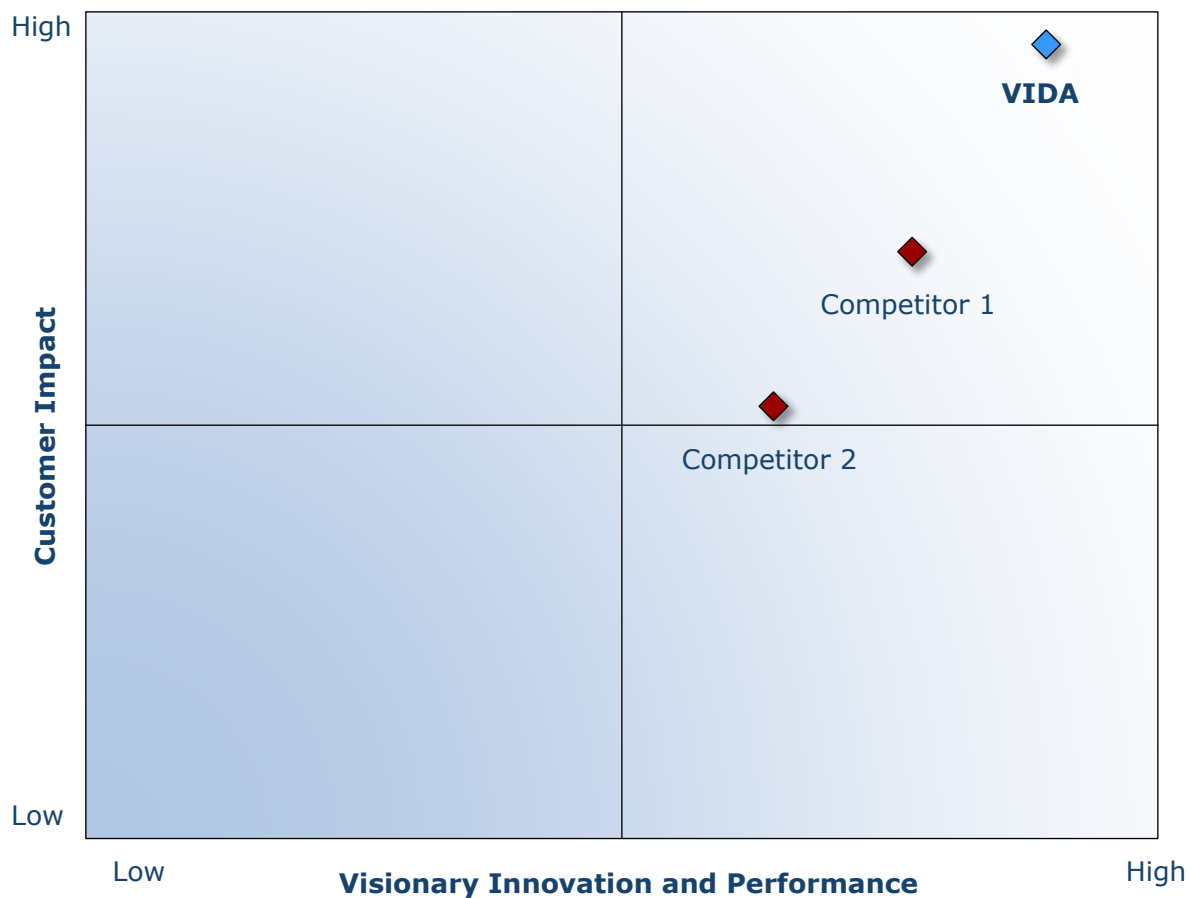
Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practice criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP		OBJECTIVE	KEY ACTIVITIES	OUTPUT
1	**Monitor, target, and screen**	Identify award recipient candidates from around the world	• Conduct in-depth industry research • Identify emerging industries • Scan multiple regions	Pipeline of candidates that potentially meet all best practices criteria
2	**Perform 360-degree research**	Perform comprehensive, 360-degree research on all candidates in the pipeline	• Interview thought leaders and industry practitioners • Assess candidates' fit with best practices criteria • Rank all candidates	Matrix positioning of all candidates' performance relative to one another
3	**Invite thought leadership in best practices**	Perform in-depth examination of all candidates	• Confirm best practices criteria • Examine eligibility of all candidates • Identify any information gaps	Detailed profiles of all ranked candidates
4	**Initiate research director review**	Conduct an unbiased evaluation of all candidate profiles	• Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles	Final prioritization of all eligible candidates and companion best practices positioning paper
5	**Assemble panel of industry experts**	Present findings to an expert panel of industry thought leaders	• Share findings • Strengthen cases for candidate eligibility • Prioritize candidates	Refined list of prioritized award candidates
6	**Conduct global industry review**	Build consensus on Award candidates' eligibility	• Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates	Final list of eligible award candidates, representing success stories worldwide
7	**Perform quality check**	Develop official award consideration materials	• Perform final performance benchmarking activities • Write nominations • Perform quality review	High-quality, accurate, and creative presentation of nominees' successes
8	**Reconnect with panel of industry experts**	Finalize the selection of the best practices award recipient	• Review analysis with panel • Build consensus • Select winner	Decision on which company performs best against all best practices criteria
9	**Communicate recognition**	Inform award recipient of recognition	• Present award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance	Announcement of award and plan for how recipient can use the award to enhance the brand
10	**Take strategic action**	Upon licensing, company able to share award news with stakeholders and customers	• Coordinate media outreach • Design a marketing plan • Assess award's role in strategic planning	Widespread awareness of recipient's award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit http://www.frost.com.