

volpara[®]solutions[™]

2014 North American Breast Imaging Solutions Technology Innovation Leadership Award



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



50 Years of Growth, Innovation & Leadership

Background and Company Performance

Industry Challenges

Frost & Sullivan has identified 'Dose Reduction' as a Mega Trend in medical imaging. This trend has a stronger reverberation in breast imaging. Globally, mammography is considered the gold standard for breast cancer screening. However, the risk of exposing women over 40 years of age, year over year, to radiation doses from mammograms has gradually emerged as a key concern. There is a debate as to whether the benefit of early detection is substantial among large populations to outweigh the risks.

Another significant development in breast imaging is the passing of the 'Breast density notification' law by several states in the U.S. in the past year. The law requires that if a woman has been identified as having dense breasts, she should be notified, and the need for additional screening should be communicated. Dense breast tissue can obstruct the viewing of cancerous lesions on a mammogram. Frost & Sullivan notes that the breast imaging industry is slowly turning its focus to breast density measurement and incorporating it in all screening programs.

Technology Excellence and Visionary Innovation of Volpara Solutions

Headquartered in New Zealand, Volpara Solutions offers an innovative range of volumetric breast imaging solutions for the early detection of breast cancer. Its suite of quantitative solutions includes Volpara Dose, Volpara Density, Volpara Analytics and Volpara Research. The Density and Dose solutions are patient-specific, while the Volpara Analytics and Research solutions are clinic-wide monitoring tools.

Commitment to Innovation

Volpara has its roots in its CEO Ralph Highnam's PhD thesis from over 20 years ago. This thesis was on model-based image processing systems for quantitative breast density measurement. Since then the company has properly maintained a highly scientific culture. It is primarily composed of professors specializing in medical imaging with vast experience in the field, who have unceasingly worked on improving the initial algorithm from Ralph Highnam's thesis. Over the last few years the company has steadily introduced several new solutions and has grown to enjoy a global reach across the U.S., Europe, Asia and Australia.

Frost & Sullivan feels that Volpara's constant commitment to innovation is largely due to the organizational culture that supports the pursuit of groundbreaking ideas.

Application Diversity

Volpara Solutions's portfolio initially consisted of only the Volpara Density solution. Volpara Solutions then developed its technology to serve multiple applications, as a result of which the company introduced its Volpara Dose and Volpara Analytics solutions.

Volpara Density is a breast density measurement tool, while Volpara Dose helps keep track of dose exposure. Volpara Analytics assists the centers in tracking performance of its systems and analyzing patient data. Volpara Research is more ideal for research facilities looking to analyze large datasets of breast measurement information captured across time.

Frost & Sullivan appreciates the fact that all of Volpara Solutions' products are integrated to work seamlessly. For example, women who are screened at a facility that has Volpara Density software installed will receive a density score card and a notification for additional screening recommendation if the case arises. Now, the Volpara Dose solution ensures that a dose score is also included in the notification, so that women are aware of the radiation dose exposure from each screening. Both these scores are automatically fed into Volpara Analytics, Volpara Solution's center-specific tool, through which the medical center can keep track of the radiation dose that every female patient is exposed to. Additionally, this tool also acts as a quality-control mechanism to check machines that emit high levels of radiation.

All of the applications are built to serve across both Full Field Digital Mammography (FFDM) and digital tomosynthesis systems and with multi-vendor compatibility and reproducible data. This is of high relevance in the industry, as tomosynthesis as a modality is quickly gaining penetration, with 30% of the members of the Society of Breast Imaging in the U.S. already using it.

Unmet Needs

Volpara Dose was developed with the aim of making the lives of women undergoing breast cancer screening more comfortable, while also evolving the screening process to make it easier. With the growing concern regarding the risk involved with the repeated exposure to radiation, women now have the ability to know exactly how much radiation they've been exposed to during a mammogram.

Combined with Volpara Analytics, it is now possible to assess the dose delivered and the compression for each of the systems in the center. For example, a center in the U.S. was using the same compression level for all patients. As a result, some patients received too little compression and a high radiation dose with low quality of image. With Volpara Analytics, the center can now set up alerts when the dose or the compression exceeds pre-determined thresholds and can also customize the screening process. Volpara Dose - combined with Volpara Analytics - also allows the radiologists to optimize towards ideal overall dose scores. All these taken together lead to better patient experience. Unlike

other traditional solutions, Volpara Solution's products focus not only on technology innovation, but also on patient comfort and the needs of the clinician - beyond just carrying out the mammogram.

Project Athena, a landmark initiative by the University of California system in breast cancer research, operates with a vision to introduce 'personalized breast cancer screening.' Volpara Solutions has been chosen as the preferred vendor to provide breast density measurement tools to this prestigious project, after a thorough comparison with the other participants in the market. As of now, Volpara Solutions has installed 150 solutions globally with its installed base steadily doubling year over year.

Use of Mega Trends

As mentioned earlier, Frost & Sullivan has identified 'Dose Reduction' as a global Mega Trend. While there are several market participants that offer breast density measurement tools, Frost & Sullivan independent analysis confirms that Volpara Solutions is the only company that has a dose measurement tool specifically for breast imaging. To control the dose, measuring volumetric breast density is a pre-requisite. In this sense, Volpara Solution has been a pioneer in the field, leveraging the Mega Trend of Dose Reduction.

Though larger industry participants, such as Bayer and GE Healthcare, are present in the dose-tracking space, their focus has been on Computed Tomography (CT). For breast-imaging modalities, Volpara Solutions clearly enjoys the first-mover advantage in identifying patient-specific dose tracking and reporting as a white-space opportunity.

Aspirational Ideals

Volpara Solutions's CEO, Ralph Highnam describes the company's vision as, "Quantitative volumetric breast imaging solutions to personalize breast screening."

"Personalization of Healthcare" has been identified by Frost & Sullivan as another global Mega Trend. Volpara Solutions has been quite visionary in this regard by focusing on developing an innovative technology that helps women and radiologists alike to track density and dose scores across time. This temporal comparison not only helps in personalizing breast screening, but also in personalizing breast cancer treatment. For example, research has shown that the cancer treatment drug, tamoxifen, is being effective when there is a reduction in breast density. Similarly, reduction in density lowers the risk of cancer, and over time women whose density scores have reduced can alter screening programs to reduce the frequency of mammograms.

Apart from the benefits of temporal comparison of data, Volpara Solutions also plans to provide its customers with access to a cloud database where they can log-in and compare data across centers. This takes breast imaging research and analytics to the next-level, facilitating researchers to compare data of women across the globe to identify geographical, racial and age-related trends. This could easily allow for building predictive

analytical models that will revolutionize early detection of breast cancer risk and save lives of women in the process.

Conclusion

Frost & Sullivan lauds Volpara Solutions for what the breast imaging market has already acknowledged: continuous leadership in technology innovation, thoughtfulness in identifying the unmet need for dose tracking in breast imaging, and a clear vision for what analytics can achieve in the early detection and treatment of breast cancer. Based on the aforementioned factors as benchmarked through Frost & Sullivan independent analysis, Volpara Solutions is the recipient of the 2014 Technology Innovation Leadership Award.

Understanding Technology Innovation Leadership

Demand forecasting, branding, and differentiation all play a critical role in achieving growth through technology innovation leadership. This three-fold focus, however, is only part of the journey. Ultimately, technology innovation leadership begins with an idea: a spark of creativity that is systematically pursued, developed, and commercialized. At times sparks arise from partnerships; perhaps they are the result of a brilliant in-house innovation team; sometimes they come from the mind of a single individual capable of brainstorming world-changing ideas all on his or her own.



Key Benchmarking Criteria

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated the total client experience and strategy implementation excellence according to the criteria detailed below.

Technology Excellence

- Criterion 1: Commitment to Innovation
- Criterion 2: Commitment to Creativity
- Criterion 3: Stage Gate Efficiency
- Criterion 4: Commercialization Success
- Criterion 5: Application Diversity

Visionary Innovation

- Criterion 1: Unmet Needs
- Criterion 2: Use of Mega Trends
- Criterion 3: Pioneering Best Practices
- Criterion 4: Blue Ocean Strategy
- Criterion 5: Aspirational Ideals

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

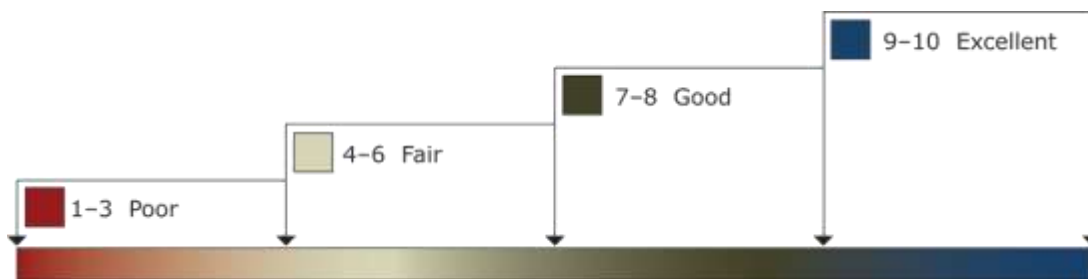
Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, leading to 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 players and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



Decision Support Scorecard and Matrix

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard and Matrix. This analytical tool compares companies' performance relative to each other. It features criteria unique to each award category and ranks importance by assigning weights to each criterion. The relative weighting reflects current market conditions and illustrates the associated importance of each criterion according to Frost & Sullivan. This tool allows our research and consulting teams to objectively analyze performance, according to each criterion, 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.



Best Practice Award Analysis for Volpara Solutions

Decision Support Scorecard: Technology Excellence

The Decision Support Scorecard illustrates the relative importance of each criterion and the ratings for each company under evaluation for the Technology Innovation Leadership Award. The research team confirms the veracity of the model by ensuring 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.

Finally, to remain unbiased and to protect the interests of all organizations reviewed, we have chosen to refer to the other key players in as Company 2 and Company 3.

DECISION SUPPORT SCORECARD FOR TECHNOLOGY INNOVATION LEADERSHIP AWARD (ILLUSTRATIVE): TECHNOLOGY EXCELLENCE

<i>Measurement of 1-10 (1 = poor; 10 = excellent)</i>	Award Criteria					
	Commitment to Innovation	Commitment to Creativity	Stage Gate Efficiency	Commercialization Success	Application Diversity	Weighted Rating
Technology Excellence						
Relative Weight (%)	20%	20%	20%	20%	20%	100%
Volpara Solutions	9.0	10.0	8.0	8.5	10.0	9.1
Company 2	8.0	6.0	8.5	8.5	6.0	7.4
Company 3	8.5	5.0	6.0	8.0	5.0	6.5

Criterion 1: Commitment to Innovation

Requirement: Conscious, ongoing development of an organization culture that supports the pursuit of groundbreaking ideas

Criterion 2: Commitment to Creativity

Requirement: Employees known for pushing the limits of form and function, and who are unafraid to pursue “white space” innovation

Criterion 3: Stage Gate Efficiency

Requirement: A process that moves creative, groundbreaking concepts quickly and profitably from early-stage investments to late-stage prototyping

Criterion 4: Commercialization Success

Requirement: A proven track record of taking new technologies to market with a high rate of success

Criterion 5: Application Diversity

Requirement: The development of technologies that serve multiple purposes and can be embraced by multiple user types

Decision Support Scorecard: Visionary Innovation

DECISION SUPPORT SCORECARD FOR TECHNOLOGY INNOVATION LEADERSHIP AWARD (ILLUSTRATIVE): VISIONARY INNOVATION

Measurement of 1-10 (1 = poor; 10 = excellent)	Award Criteria					
	Unmet Needs	Use of Mega Trends	Pioneering Best Practices	Blue Ocean Strategy	Aspirational Ideals	Weighted Rating
Visionary Innovation						
Relative Weight (%)	20%	20%	20%	20%	20%	100%
Volpara Solutions	10.0	10.0	9.5	9.0	10.0	9.7
Company 2	6.0	5.0	7.5	6.0	8.0	6.5
Company 3	6.5	5.0	8.0	5.0	8.5	6.6

Criterion 1: Unmet Needs

Requirement: A clear understanding of customers’ desired outcomes, the products that currently help them achieve those outcomes, and where key gaps may exist

Criterion 2: Use of Mega Trends

Requirement: Ability to incorporate long-range, macro-level scenarios into strategic plans, thereby anticipating and preparing for multiple futures that could occur

Criterion 3: Pioneering Best Practices

Requirement: A nothing-ventured-nothing-gained approach to strategy implementation that results in processes, tools, or activities that generate a consistent and repeatable level of success.

Criterion 4: Blue Ocean Strategy

Requirement: Proven track record of creating new demand in an uncontested market space, rendering the competition obsolete

Criterion 5: Aspirational Ideals

Requirement: A willingness to look beyond the simple goal of generating a profit to embrace a more powerful ideal of bringing greater value to customers or the planet

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to 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 practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.