2015 North American Breast Imaging Systems Product Line Strategy Leadership Award
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Background and Company Performance

Industry Challenges

Breast cancer is the leading cause of death in the United States, accounting for approximately 40,000 deaths annually, with an estimated 12% of women diagnosed. During its earliest stages, breast cancer is often impalpable and does not show any sign or symptom. Identifying and treating breast cancer as early as possible is critical for preventing it from metastasizing to the lymph nodes or other parts of the body and also for improving a victim’s chances of survival.

There are several medical imaging technologies available that help detect breast cancer during its earliest stages. X-ray mammography is considered the gold standard for periodic screening. According to the National Cancer Institute (NCI), periodic screening using X-ray mammography in asymptomatic women between the ages of 40 and 74 significantly reduces breast cancer mortality rates.

However, there is no one-shot imaging system that detects cancer accurately, which consequently leads to false positives. This is common in patients with dense breasts and patients with breast implants. In this context, companies that focus on innovating advanced technologies with effective diagnosis are best positioned to stay ahead of competition within the North American breast imaging systems industry.

Customer Value Excellence and Product Family Strategy of GE Healthcare

Product Comprehensiveness in Breast Imaging Systems

GE Healthcare has made significant contributions to the field of diagnostic imaging and is considered a trendsetter in radiology. In the past decade, the need for effective solutions for breast cancer detection has increased, leading to several technological innovations. However, there is no one such silver bullet solution and, in some instances, the need for supplemental imaging through other sources becomes essential. The contemporary diagnostic imaging systems include X-ray mammography (such as analog X-ray, computed radiography, digital radiography, and 3D digital breast tomosynthesis), ultrasound (such as hand-held ultrasound and 3D automated breast ultrasound), breast magnetic resonance imaging (MRI), and molecular breast imaging systems.

Most medical imaging companies have traditional products, such as X-ray, ultrasound, MRI, and computed Tomography (CT) scanners. Solutions such as 3D digital breast tomosynthesis, automated breast ultrasound, and molecular breast imaging are relatively new technologies and GE Healthcare has expanded its product line with the development and inclusion of the entire breast imaging systems. In 2014, it obtained the Food and Drug Administration (FDA)’s approval for 3D digital breast tomosynthesis, which is a three-dimensional (3D) mammography solution. GE Healthcare acquired U-Systems, a company that develops early 3D automated breast ultrasound systems, for screening
technology specifically designed for dense-breasted patients. These 2 technologies are unique and are capable of diagnosing cancer at an early stage and can be used in patients with varying degrees of risk for a personalized approach to breast health.

With this, the company has a comprehensive portfolio of products required for breast cancer diagnosis and is complimented by their adaptable portfolio of technologies, services and insights including IT, diagnostic laboratory services, digital pathology, asset & workflow optimization and financing solutions.

Frost & Sullivan has observed that GE Healthcare’s breast care technologies are scalable to enhance image quality, handle more procedural volume and available at economically feasible price points.

**Technology Leverage**

GE Healthcare is committed to innovation and this is best demonstrated by the wide range of technologies the company has incorporated in designing its breast imaging solutions.

**Digital Breast Tomosynthesis:**

GE Healthcare introduced its digital breast tomosynthesis system in 2014. GE’s SenoClaire* breast tomosynthesis is a three-dimensional imaging technology that uses a low-dose short X-ray sweep around the compressed breast with only nine exposures. This imaging technique is designed to separate the tissues and to reduce the overlapping of structures, which represents a limiting factor in standard 2D mammography and the dose of a SenoClaire 3D view is equivalent to that of a 2D standard acquisition of the same view. This technology uses the technique of ‘step and shoot’—a tube motion that preserves micro-calcification sharpness and avoids image blur, as the tube makes a complete stop for each of the exposures that eliminates the blurring of images.

**Automated Breast Ultrasound:**

GE Healthcare was the first company to obtain FDA approval in 2013 for its 3D automated breast ultrasound solution to be used as an adjunct to mammography in dense-breasted patients. In 2014, Invenia™ ABUS incorporated massive parallel processing power and proprietary beam-forming technology to aid in the detection of early-stage cancer in dense-breasted patients. Advanced imaging algorithms automate the imaging process to help provide remarkable image quality and reproducibility from user to user. The reverse curved transducer is shaped to cover women’s anatomy and enables user-friendly operation. Invenia ABUS has demonstrated a 55% relative increase in invasive cancer detection over mammography alone in the dense breast population.

**Molecular Breast Imaging:**

The molecular breast imaging solution of GE Healthcare provides the ability to visualize functional information over anatomical changes. This is crucial to distinguish between a
viable and non-viable mass, and eliminates unnecessary scans or biopsies and thus, finds wide use in dense-breasted patients, as well as small organ imaging. It is also used in the early detection of cancer and utilizes leading-edge solid-state Cadmium Zinc Telluride (CZT) detectors (which incorporate dual detectors and high-quality imaging resolutions) that enhance imaging sensitivity when compared to other manufacturers’ products that encompass single detectors. It opens the gate for low dose and shorter exams and provides the flexibility to manage dose & acquisition time to meet personalized needs of patient. The system is capable to perform lymphoscintigraphy scans as well and produce high quality images that are essential for accurate sentinel node localization and harvesting of the sentinel node in breast cancer patients.

**Price/Performance Value**

GE Healthcare, with its wide range of user-friendly products, helps lead to superior diagnosis and detection of breast cancer when compared to traditional 2D mammography and significantly reduces recall rate. All the products are designed to facilitate early detection of breast cancer so as to improve treatment protocols and prevent the need for repeated diagnosis. With traditional treatment protocols, there are chances for higher radiation; the products of GE are designed to reduce radiation dose. The recently introduced systems (such as 3D automated breast ultrasound in 2013 and 3D digital breast tomosynthesis in 2014) are priced between US $200,000 and US $450,000 and are competitive when compared to other market participants in North America. According to Frost & Sullivan’s research, these imaging systems offer patients and healthcare providers the best value for money, as they eliminate the need for repeat diagnosis. Benefits accrued by spending on the unique technologies are justified, considering the diagnostic capabilities that its systems feature.

**Customer Purchase Experience**

GE Healthcare partners globally with universities and research institutes from the product development stage through completion. End users are highly satisfied with the overall services (including pre-sales, installation, after-sales service, and ready availability of parts and accessories to ensure minimal downtime) of GE Healthcare. Additionally, GE Healthcare has increased the advantage of both sales and service network for strong penetration across the country, where it aims to achieve increased revenue. Furthermore, it offers a diverse product portfolio along with discounts, through bundled offerings, to suit individual requirements, thereby increasing its penetration in both public as well as private clinics across the United States. The efficacy of its products has been established by the successful introduction of products such as 3D digital breast tomosynthesis and 3D automated breast ultrasound in more than 500 hospitals in the United States between 2012 and 2014.
Brand Equity

GE Healthcare has introduced and developed high-end medical imaging solutions for various diagnosis of the human body. With its expertise and extensive experience in diagnostic imaging, the company has successfully ventured into developing trend-setting technologies. To maintain its competitive position in the market, GE healthcare has adopted a classical approach for product development. Identifying and understanding client needs, the company seeks to develop specific solutions and designs software or integration techniques to ensure compatibility with the customers’ existing systems, thereby enhancing its brand value and, in turn, customer loyalty. The company also announced its spending of $1 billion of its total research and development (R&D) budget for the next 5 years to expand its advanced cancer diagnostic and molecular imaging capabilities. The company gauges its branding through dynamic measures, such as customer word-of-mouth, and uses testimonials to enhance its reputation among hospitals upon introduction of products in breast health imaging.

Conclusion

Recognizing GE Healthcare’s dedication to improve the diagnosis for breast cancer detection, Frost & Sullivan applauds the enhanced value that the company provides its customers through its unique and differentiated range of products. Innovation is the company’s key to success, and the company consistently ensures maximum return on investment to customers by introducing new technologies that enhance the quality of care for patients. By maintaining close relationships with customers, GE Healthcare focuses on designing innovative products across breast imaging and effectively addressing prevailing industry challenges to successfully meet customers’ needs.

With its strong overall performance, GE Healthcare has earned Frost & Sullivan’s 2015 Product Line Strategy Leadership Award.
Significance of Product Line Strategy Leadership

Ultimately, growth in any organization depends upon customers purchasing from your company, and then making the decision to return time and again. A full, comprehensive product line that addresses numerous customer needs and preferences is therefore a critical ingredient to any company’s long-term retention efforts. To achieve these dual goals (customer value and product line strength), an organization must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.
**Key Benchmarking Criteria**

**Product Line Strength**
- Criterion 1: Breadth
- Criterion 2: Scalability
- Criterion 3: Technology Leverage
- Criterion 4: Features
- Criterion 5: Supply Chain Reliability

**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 Practice Award Analysis for GE Healthcare**

**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 our 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**

The Decision Support Scorecard is organized by Technology Attributes and Future Business Value (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criteria 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, we have chosen to refer to the other key players as Competitor 2 and Competitor 3.
DECISION SUPPORT SCORECARD FOR PRODUCT LINE STRATEGY LEADERSHIP AWARD

<table>
<thead>
<tr>
<th>Measurement of 1–10 (1 = poor; 10 = excellent)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Line Strategy</strong></td>
<td></td>
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<tr>
<td><strong>Product Line Strength</strong></td>
<td></td>
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<tr>
<td><strong>Customer Impact</strong></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Average Rating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE Healthcare</td>
<td>9</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>Competitor 2</td>
<td>8</td>
<td>8</td>
<td>8.0</td>
</tr>
<tr>
<td>Competitor 3</td>
<td>7</td>
<td>6</td>
<td>6.5</td>
</tr>
</tbody>
</table>

**Product Line Strength**

**Criterion 1: Breadth**
Requirement: Product line addresses the full range of customer needs and applications

**Criterion 2: Scalability**
Requirement: Product line offers products at a variety of price points and functionality levels

**Criterion 3: Technology Leverage**
Requirement: Demonstrated commitment to incorporating leading edge technologies into product offerings, for greater product performance and value

**Criterion 4: Features**
Requirement: Products offer a comprehensive suite of features to serve customers at multiple levels of functionality, ease of use and applications

**Criterion 5: Supply Chain Reliability**
Requirement: There is sufficient control over the supply chain to ensure availability of key components and thereby the availability of products in the product line

**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 like they are buying the most 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 can 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.

DECISION SUPPORT MATRIX FOR PRODUCT LINE STRATEGY LEADERSHIP AWARD

![Decision Support Matrix Diagram]
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.
Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan Awards 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.

<table>
<thead>
<tr>
<th>STEP</th>
<th>OBJECTIVE</th>
<th>KEY ACTIVITIES</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monitor, target, and screen</td>
<td>Identify award recipient candidates from around the globe</td>
<td>Pipeline of candidates who potentially meet all best-practice criteria</td>
</tr>
<tr>
<td>2</td>
<td>Perform 360-degree research</td>
<td>Perform comprehensive, 360-degree research on all candidates in the pipeline</td>
<td>Matrix positioning all candidates’ performance relative to one another</td>
</tr>
<tr>
<td>3</td>
<td>Invite thought leadership in best practices</td>
<td>Perform in-depth examination of all candidates</td>
<td>Detailed profiles of all ranked candidates</td>
</tr>
<tr>
<td>4</td>
<td>Initiate research director review</td>
<td>Conduct an unbiased evaluation of all candidate profiles</td>
<td>Final prioritization of all eligible candidates and companion best-practice positioning paper</td>
</tr>
<tr>
<td>5</td>
<td>Assemble panel of industry experts</td>
<td>Present findings to an expert panel of industry thought leaders</td>
<td>Refined list of prioritized award candidates</td>
</tr>
<tr>
<td>6</td>
<td>Conduct global industry review</td>
<td>Build consensus on award candidates’ eligibility</td>
<td>Final list of eligible award candidates, representing success stories worldwide</td>
</tr>
<tr>
<td>7</td>
<td>Perform quality check</td>
<td>Develop official award consideration materials</td>
<td>High-quality, accurate, and creative presentation of nominees’ successes</td>
</tr>
<tr>
<td>8</td>
<td>Reconnect with panel of industry experts</td>
<td>Finalize the selection of the best-practice award recipient</td>
<td>Decision on which company performs best against all best-practice criteria</td>
</tr>
<tr>
<td>9</td>
<td>Communicate recognition</td>
<td>Inform award recipient of award recognition</td>
<td>Announcement of award and plan for how recipient can use the award to enhance the brand</td>
</tr>
<tr>
<td>10</td>
<td>Take strategic action</td>
<td>Upon licensing, company may share award news with stakeholders and customers</td>
<td>Widespread awareness of recipient’s award status among investors, media personnel, and employees</td>
</tr>
</tbody>
</table>
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.