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EMERSON
Process Management

2015 Global Portable Vibration Monitoring Product Innovation Award

2015

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BEST PRACTICES AWARD

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50

50 Years of Growth, Innovation & Leadership

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Industry Challenges

The global portable vibration monitoring market is mature yet still evolving, plagued by a wide range of challenges. In the portable/offline segment, in particular, hardware is becoming increasingly commoditized and product differentiation is diminishing. In this highly competitive market, most equipment vendors have struggled to understand the importance of upgrading their solutions in line with changing modern technology and preferences. In addition, the lack of a skilled workforce is driving customers to depend on their vibration monitoring hardware providers for value-added features and functionalities.

With a growing consumer awareness and emphasis on improving plant productivity and efficiency, Frost & Sullivan believes that companies who can effectively integrate and utilize the latest advances in modern technology will be highly successful in this market.

Product Attributes and Customer Impact

Match to Needs

Emerson is widely recognized as the global market leader in the portable vibration monitoring equipment market and with the launch of the AMS 2140 Machinery Health Analyzer, it has only added to its legacy of unmatched innovation. The genesis of this product lies in the company's extensive and well-structured customer feedback mechanisms involving both online and one-on-one interactions.

Emerson's journey to excellence and leadership in this market began with the launch of one of the industry's first portable machine vibration analyzers during the early 1990s. Prior to the launch of the AMS 2140, the company had already launched an array of preceding products, namely, CSI 2100, 2110, 2115, 2120, and 2130, over the years, with each of them boasting considerable improvements over its immediate predecessor. In each case, the improvements were a result of a robust customer feedback mechanism. Similarly, when the CSI 2130 was launched, Emerson dedicated itself to understanding customer needs and perceptions which fed directly into the product development strategies of the AMS 2140. Emerson was able to consistently receive customer feedback through the lifecycle of the 2130 through its online product enhancement feedback site. Also, a direct link to this site was embedded into the product software to encourage customers to post valuable opinions regarding product design, performance, and usability. Emerson also contracted a third-party research firm to jointly visit customer sites as well as observe and analyze users of the CSI 2130. Detailed findings and observations regarding actual onsite usage, physical ergonomics, and preferences of the user were recorded. This data was then used to develop a prototype of the AMS 2140 to be tested by Emerson's customers. The final design concept of the AMS 2140 was further iterated from

this feedback to create the industry leading solution that it is today, largely influenced by human-centered design principles.

The AMS 2140 is, therefore, not only lighter and sleeker in design than its predecessors, but it has also made route data collection considerably more efficient. The full-color touchscreen has transformed data visualization irrespective of the lighting conditions, while the lithium-ion battery has ensured reliable and uninterrupted functioning of the device. This battery has also eliminated the need to charge the vibration analyzer more than once during a shift.

The incorporation of Wi-Fi and Bluetooth capability has not only improved the overall usability of the device but also made transferring route data to a remote database seamless.

The market's response to the AMS 2140 has been remarkable, driving Emerson's growth in this segment to well above the industry average.

Reliability

Emerson has incorporated some of the latest technologies and advancements into the AMS 2140, including touchscreen capabilities, wireless and Bluetooth connectivity, and modular design, making it sleeker, faster, and more durable than its peers. But the stand-out feature that has considerably enhanced the user experience is its ability to improve the efficiency of route data collection.

The AMS 2140's 4-channel option combined with the A0643TX, Emerson's patented magnetic triaxial accelerometer, significantly improves the speed and efficiency of the data collection route, guaranteeing smart, time-effective, yet high-quality data collection. The traditional route data collection methodology requires a sensor to be positioned in multiple locations on each bearing of the machine. While Emerson's 4-channel solution simultaneously collects axial, vertical, and horizontal data on a single bearing in real time. AMS 2140's 4-channel data collection approach is proven to be 30% quicker than that of the CSI 2130, which was considered to be one of the fastest analyzers available on the market when it was launched. The AMS 2140 also exhibits over 50% improvement in router data collection efficiency—a remarkable achievement that has set a new industry standard for performance and efficiency. The ability to collect data on 4 channels simultaneously also enables broader and more advanced diagnoses of machinery faults.

Quality

The IP65 rating of Emerson's AMS 2140 indicates that the product is designed to exhibit best-in-class performance amidst extreme weather and industrial conditions. Both laboratory as well as real-world experiments that were conducted for 6 months to guarantee unmatched quality of the machine analyzers, suggest that the product displays commendable resistance against shock and extreme humid conditions. AMS 2140 has also

exhibited optimal performance in extreme temperature conditions (from -10°C up to 50°C). It complies with the Factory Mutual (FM), Canadian Standards Association (CSA), and Class 1, Division 2, Groups A, B, C, and D standards. Its compliance with safety standards and procurement of these certifications are the most striking examples of the company's customer-centric product development strategies.

Customer Ownership Experience

Emerson's ability to identify the changing requirements of the new-age machine vibration analysts and seamlessly integrate the required developments into its product to improve both design and functionalities has translated into a robust customer ownership experience. The AMS 2140's minimalist aesthetics, ergonomic design, wireless device interface, and laser alignment technology all contribute to an unparalleled customer ownership experience. While the minimalist product aesthetics makes it easier for predictive analysts of machine health condition to carry the device to the field, the ergonomic design simplifies data viewing and enables prompt device diagnosis. Weighing 1.79 kg, the AMS 2140 contains an XY resistive touchscreen with 640 x 480 pixel resolution along with an auto-adjusting light feature to simplify data viewing in different environments. The device also incorporates a keypad with 12 tactile dome keys on an electroluminescent panel. The company has also added intuitive features to the device to scale user experience. For instance, to understand the function of a certain key, a user is only required to press that key along with the question mark key. This simple action automatically generates a user manual elaborating the purpose of the key. Emerson has also developed a user manual that is available as a mobile application that customers can access through their cell phones. Moreover, to facilitate its existing customers' transition from the CSI 2130 to the AMS 2140, Emerson has maintained a familiar user interface.

Customer Purchase Experience

To offer customers a fulfilling purchase experience, Emerson relies on in-depth training courses and extensive social media connectivity. The company offers a broad spectrum of machine health training courses that have been designed with the company's 65-year expertise in customer and user training. These study materials are aimed at addressing the diverse requirements of both customers and users.

Emerson also focuses on media exposure (both in traditional and digital formats) to establish professional proximity to customers around the globe. In this context, the systematic publication of high-quality, informative news articles and alerts for the benefit of its existing and potential customers are powerful instruments of marketing employed by the company. These articles and alerts function as critical marketing tools and also help Emerson showcase its plans and future programs. Furthermore, the company's active presence on a vast array of social media platforms, such as Facebook, Twitter, LinkedIn, Google+, and YouTube, has helped it provide customers with the right information at the right time to generate the best purchase experience.

Conclusion

Emerson's AMS 2140 reemphasizes not only the company's technological vision but also its drive to stay ahead of the competition and remain at the forefront of the market. Bringing together some of today's most modern technologies and advancements into one product, Emerson has once again reset the bar in the portable vibration monitoring market with the AMS 2140. Because of its strong overall performance, Emerson is recognized with Frost & Sullivan's 2015 Product Innovation Award in the global portable vibration monitoring equipment market.

Significance of Product Innovation

Ultimately, growth in any organization depends upon continually introducing new products to the market, and successfully commercializing those products. For these dual goals to occur, a company must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.

Understanding Product Innovation

Innovation is about finding a productive outlet for creativity—for consistently translating ideas into high quality products that have a profound impact on the customer.

Key Benchmarking Criteria

For the Product Innovation Award, Frost & Sullivan analysts independently evaluated two key factors—Product Attributes and Customer Impact—according to the criteria identified below.

Product Attributes

Criterion 1: Match to Needs
Criterion 2: Reliability
Criterion 3: Quality
Criterion 4: Positioning
Criterion 5: Design

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 Emerson

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
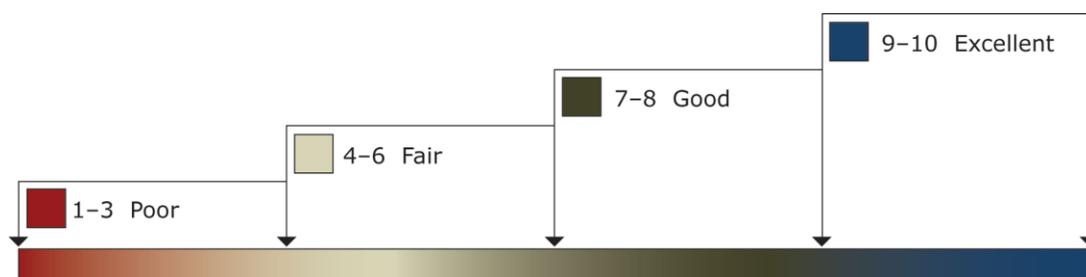
The Decision Support Scorecard is organized by Product Attributes and Customer Impact (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criteria are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity 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.

Measurement of 1–10 (1 = poor; 10 = excellent)			
Product Innovation	Product Attributes	Customer Impact	**Average Rating**
Emerson	**9.5**	**9.0**	**9.2**
Competitor 2	8.0	7.5	7.7
Competitor 3	7.0	7.0	7.0

Product Attributes

Criterion 1: Match to Needs
Requirement: Customer needs directly influence and inspire the product's design and positioning

Criterion 2: Reliability
Requirement: The product consistently meets or exceeds customer expectations for consistent performance during its entire life cycle

Criterion 3: Quality
Requirement: Product offers best-in-class quality, with a full complement of features and functionality

Criterion 4: Positioning
Requirement: The product serves a unique, unmet need that competitors cannot easily replicate

Criterion 5: Design
Requirement: The product features an innovative design, enhancing both visual appeal and ease of use

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
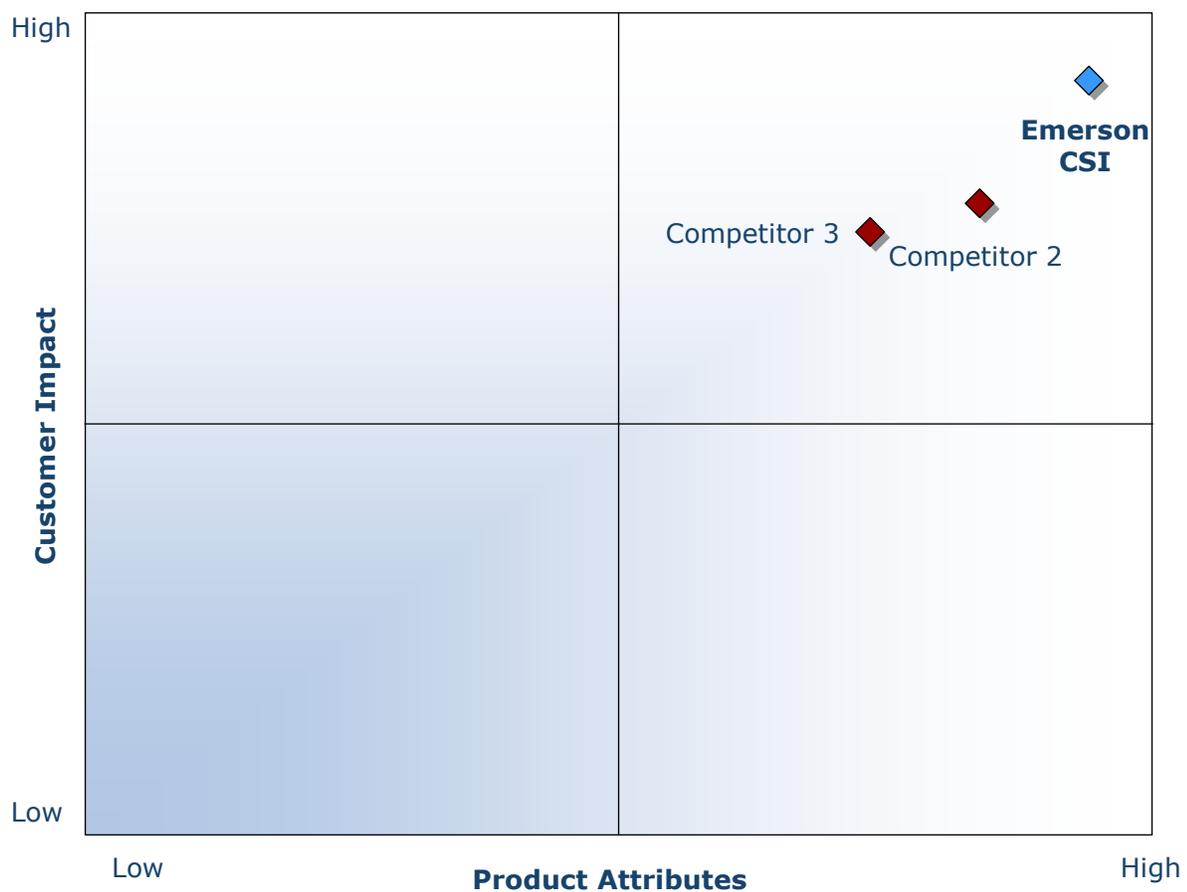
Criterion 4: Customer Service Experience
Requirement: Customer service is accessible, fast, stress-free, and of high quality

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.

High

Emerson CSI

Competitor 3   Competitor 2

Customer Impact

Low

Low   **Product Attributes**   High

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

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.

	STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1	**Monitor, target, and screen**	Identify award recipient candidates from around the globe	• Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies	Pipeline of candidates who potentially meet all best-practice 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-practice criteria • Rank all candidates	Matrix positioning all candidates' performance relative to one another
3	**Invite thought leadership in best practices**	Perform in-depth examination of all candidates	• Confirm best-practice 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-practice 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-practice award recipient	• Review analysis with panel • Build consensus • Select winner	Decision on which company performs best against all best-practice criteria
9	**Communicate recognition**	Inform award recipient of award 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 may share award news with stakeholders and customers	• Coordinate media outreach • Design a marketing plan • Assess award's role in future strategic planning	Widespread awareness of recipient's award status among investors, media personnel, and employees

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.