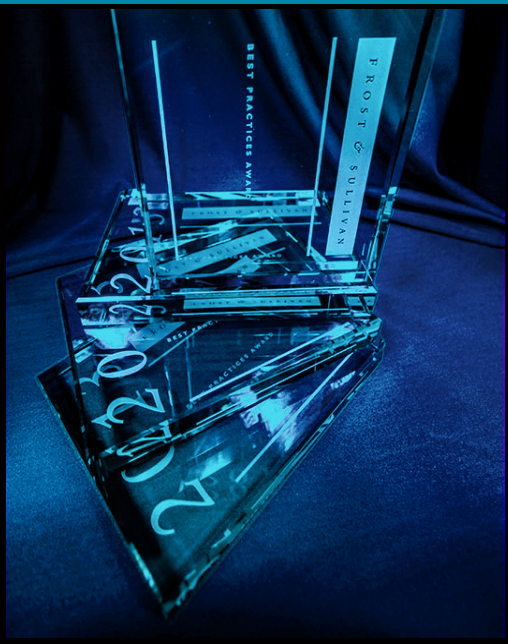


F R O S T & S U L L I V A N



2016 Global
RF Signal Record & Playback Solutions
Customer Value Leadership Award



FROST & SULLIVAN

BEST
2016 PRACTICES
AWARD

GLOBAL RF SIGNAL
RECORD & PLAYBACK SOLUTIONS
CUSTOMER VALUE LEADERSHIP AWARD

2016
BEST PRACTICES
AWARDS

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Background and Company Performance

Industry Challenges

The growing use of wireless connected devices such as mobile phones, laptops, computers, wearables and smart home appliances and industrial equipment has given rise to a plethora of wireless communication protocols in any given bandwidth. This wireless congestion often causes interference among signals. Billions of connected devices used globally are expected to function smoothly in this complex environment without interfering with one another. To ensure optimal performance, therefore, wireless devices need to be tested not only in controlled laboratory environments but also in real-world conditions with natural impairments. One of the ways to achieve this is by adopting radio frequency (RF) record and playback solutions that capture the RF signals in the field, record the data, and play them back in a laboratory.

RF record and playback solutions help address challenges in monitoring the RF spectrum for illegal usage or transmission and testing wireless transceiver units, navigation systems, radars, and mobile phones. However, to perform these tasks effectively, RF record and playback solutions must achieve high streaming rates and volume, correlate the recorded data with field conditions, process the captured data, integrate with other test equipment, and upgrade specifications and features to enable the testing of new wireless communication standards.

With RF record and playback solutions playing a significant role in the rapidly growing communication test market, RF communication test engineering solution providers that can offer value-adding, reliable, flexible, and future-proof solutions to effectively address diverse customer requirements are expected to secure a leadership position in this market.

Customer Impact and Business Impact

Price/Performance Value

Headquartered in Montreal, Canada, Avera was incorporated in 1999 as a system integrator for automated test systems. Over the years, the company has grown into a leading test engineering solution provider with global operations—its large test-station manufacturing facility in Guadalajara, Mexico and its Innovation Lab for RF and field-programmable gate array (FPGA) research in Atlanta being particularly noteworthy. Avera's key test and measurement original equipment manufacturer (OEM) partners include National Instruments (NI) and Keysight Technologies. The company provides its customers with test instruments, test engineering solutions, professional services and technical support. Avera's RF record and playback solutions fall under its test instruments business.

In June 2015, Avera launched its RP-6100 series of multi-channel RF record and playback solutions. Offering these solutions in desktop, portable, and rackmount versions, Avera allows customers to optimize their usage, based on whether it is a simple desktop measurement, a field trial, or an extensive design test in a laboratory. This is in contrast to the value propositions of its key competitors that offer lesser range solutions and often either a portable or a rackmount option only.

The RP-6100 series is based on NI's Universal Software Radio Peripheral (USRP) and modular PCI eXtensions for instrumentation. These handle a frequency range of 10 MHz (megahertz) to 6 GHz (gigahertz) covering all Global Navigation Satellite System (GNSS) bands, HD Radio, Wi-Fi, Long-Term Evolution (LTE), and other signals. Moreover, with a high-speed streaming bus such as Ethernet along with solid state drive (SSD) storage options, the RP-6100 series enables streaming of up to 160-MHz bandwidth at 14-bit resolution for 20 hours, capturing up to 16 TB (terabytes) of data.

Being based on a software-defined radio (SDR) platform, Avera's RF record and playback solutions enable the customization of different test features through software. Avera also provides the RF Studio Software solution that enables the capture, recording, playback, and analysis of real-world RF spectrums for product design validation and research projects. Using the same equipment for multiple applications reduces costs for the customer. For instance, Avera helped Trimble, a leading GNSS receiver maker, improve its testing accuracy from meters to centimeters, collect and analyze 10 times more test data, increase throughput and reduce costs by avoiding repetitive field testing. While Trimble earlier used to perform 680 field tests a year, using the playback system it could perform these tests within the laboratory.

Avera's RF record and playback solutions record audio and video data and integrate them with interactive maps to synchronize and correlate the RF data with field conditions. Additionally, using a modular platform, Avera can increase the number of channels, integrate other tests (leveraging its Universal Receiver Tester (URT) option), or add video testing, audio testing, and other electronic or communication testing functions to provide a seamlessly integrated solution.

Customer Ownership Experience

Avera enhances the customer ownership experience through its structured and process-oriented approach. Its sales team is structured based on the needs of different industry verticals to facilitate domain-specific test solutions and consultation. Moreover, at any given point, the company has about 60 engineers in the field, meeting customer requirements. With its test engineering capabilities, Avera has moved up the product development life cycle, and is actively involved in providing solutions at design and research & development stages, in addition to production testing solutions. A thorough understanding of the products and testing needs of customers enables the company to

provide optimal and holistic test solutions.

Certified by the International Organization for Standardization (ISO), Control System Integrators Association (CSIA), and the Controlled Goods Program (CGP), Avera ensures high standards of process and service quality for its customers. This is underscored by positive customer testimonials and case studies for Avera's solutions across industries such as aerospace and defense, automotive, and consumer electronics. Trimble and a leading manufacturer of high-performance in-car infotainment systems have lauded Avera as a great test engineering partner that has helped them perform tests with repeatable field data in lab conditions, reducing both time and cost. According to Autoliv Inc., Avera has reduced the test time for its Short Range Radar Signal Processing board by 75% and improved vehicle passenger safety. With such successful solutions, Avera clearly enhances customer value and satisfaction.

Brand Equity

Over the years, Avera has enhanced its brand equity in the test engineering space through the sheer quality of its solutions and its ability to add value for customers. The company has provided successful RF record and playback solutions to highly reputed companies in different industries. As RF communication test applications are critical and involve high-value solutions, customers often prefer solution providers with good credibility and strong brand reputation. Avera understands this and constantly works toward increasing its brand equity leveraging a strong marketing team.

Avera distributes bi-monthly informational materials (comprising, for instance, trend reports and white papers) to customers and potential clients. It also shares a series of best practices in the automated test industry through an eLearning platform, Test Guru, to educate its customers and increase their engagement. The company also actively participates in all major test and measurement trade shows and conferences to consolidate its position as a leading test engineering solution provider.

Customer Acquisition

Since its inception, Avera has successfully delivered more than 4,200 projects globally in different industry verticals such as aerospace and defense, consumer electronics, automotive, life sciences, and telecommunications infrastructure. In the market for RF record and playback solutions, Avera caters to key Tier 1 OEMs in automotive, aerospace & defense, and consumer electronics industries. Over the past 18 months, Avera has acquired Cal-Bay systems, on the US West Coast, and Test & Measurement Solutions in Europe. These acquisitions increase Avera's global reach as well as provide a strong local presence. Avera's sales team focuses on the specific needs of different industry verticals and seeks to expand its customer base using a consultative approach. Furthermore, its recent International Traffic in Arms Regulations (ITAR) registration opens up opportunities for the company to acquire more defense clients.

Growth Potential

The market for RF record and playback solutions is set to grow at a rapid rate, driven by the exponential growth of the connected devices market (expected to reach 50 billion devices by 2020). As a leading player in this space, Avera is set to capture a significant market share, which is expected to grow by 12% annually for the next 10 years. Moreover, with the inauguration of its Innovation Lab in Atlanta in February 2016 with a strong focus on RF and FPGA technologies, Avera is set to focus on developing solutions targeting emerging applications in the communication and embedded market, enhancing its growth potential. With such visionary initiatives, a focus on developing solutions from the early stages of the product life cycle, ability to cater to diverse end-user markets, and a global presence, Avera is strongly poised to grow rapidly.

Human Capital

Avera has about 425 employees globally, with more than 50 of them being part of its research and development department. The company has the highest number of NI-certified architects and developers among NI's Alliance Partners. The company's vision is shared with its employees globally through an internal newspaper called Dialogue, translated in different local languages across different office locations. Avera's strong human resources team ensures clear and prompt communication as well as employee motivation through various team-building activities at regular intervals. The company constantly adds to its human capital by opening new offices around the globe as well as through acquisitions.

Conclusion

With its flexible, modular, and software-defined platforms for RF signal record and playback applications, Avera provides its customers with optimal solutions for their RF communication testing needs. Frost & Sullivan's independent analysis clearly shows that by providing a single platform solution for testing all GNSS bands, HD Radio, Wi-Fi, LTE, and more, Avera ensures both convenience and cost effectiveness for its customers. Through strong visionary initiatives such as setting up their Innovation Lab for research in RF and FPGA domains, a product focus targeting growing markets, catering to diverse market needs, and ensuring a global presence, Avera strives to maximize the value proposition for customers.

Because of its strong overall performance, Avera has earned Frost & Sullivan's 2016 Global Customer Value Leadership Award.

Significance of Customer Value Leadership

Ultimately, growth in any organization depends upon customers purchasing from your company, and then making the decision to return time and again. Delighting customers is therefore the cornerstone of any successful growth strategy. To achieve these dual goals (growth and customer delight), an organization must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding Customer Value Leadership

Customer Value Leadership is defined and measured by two macro-level categories: customer impact and business impact. These two sides work together to make customers feel valued, and confident in their products' quality and long shelf life. This dual satisfaction translates into repeat purchases and a high lifetime customer value.

Key Benchmarking Criteria

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Customer Impact and Business Impact—according to the criteria identified below.

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

Business Impact

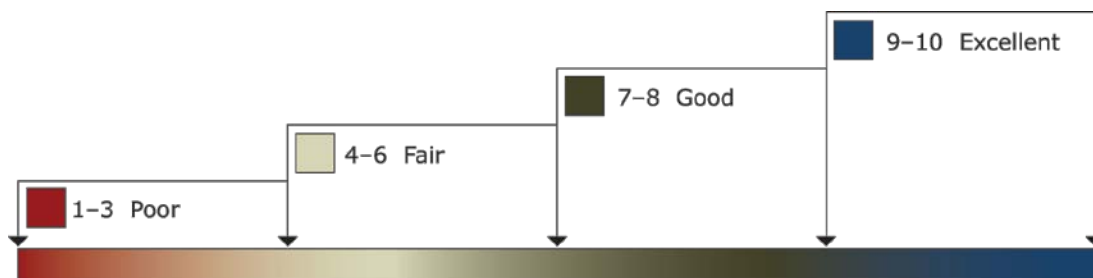
- Criterion 1: Financial Performance
- Criterion 2: Customer Acquisition
- Criterion 3: Operational Efficiency
- Criterion 4: Growth Potential
- Criterion 5: Human Capital

Best Practice Award Analysis for Avera

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 Customer Impact and Business 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, Frost & Sullivan chooses to refer to the other key players as Competitor 2 and Competitor 3.

DECISION SUPPORT SCORECARD: CUSTOMER VALUE LEADERSHIP AWARD

<i>Measurement of 1–10 (1 = poor; 10 = excellent)</i>			
Customer Value Leadership	Customer Impact	Business Impact	Average Rating
Averna	9.3	9.1	9.2
Competitor 2	8.6	8.0	8.3
Competitor 3	7.5	8.3	7.9

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

Business Impact

Criterion 1: Financial Performance

Requirement: Strong overall financial performance in terms of revenues, revenue growth, operating margin and other key financial metrics

Criterion 2: Customer Acquisition

Requirement: Customer facing processes support the efficient and consistent acquisition of new customers, even as it enhances retention of current customers

Criterion 3: Operational Efficiency

Requirement: Staff is able to perform assigned tasks productively, quickly, and to a high quality standard

Criterion 4: Growth Potential

Requirements: Customer focus strengthens brand, reinforces customer loyalty and enhances growth potential

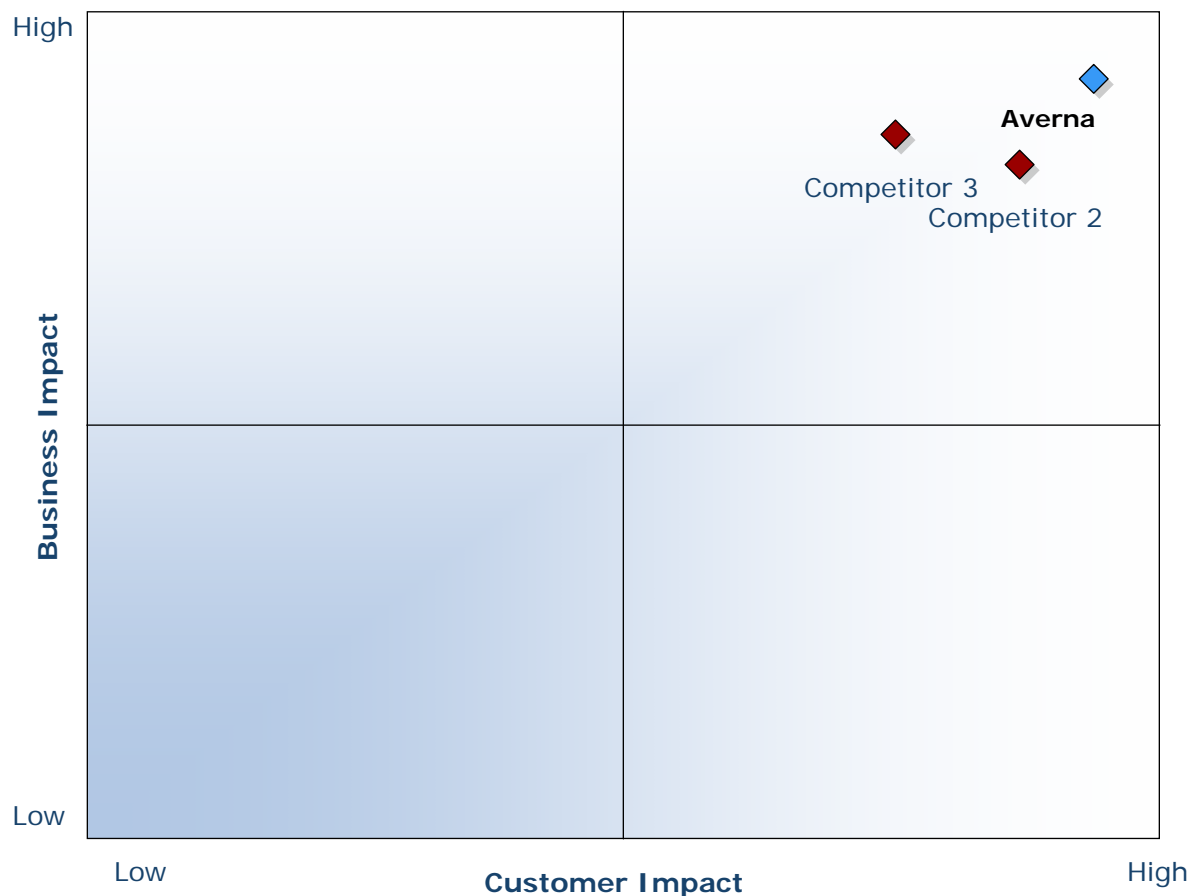
Criterion 5: Human Capital

Requirement: Company culture is characterized by a strong commitment to quality and customers, which in turn enhances employee morale and retention

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: CUSTOMER VALUE LEADERSHIP AWARD



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



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 over 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 40 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.