

FROST & SULLIVAN

# BEST PRACTICES

AWARDS

FROST & SULLIVAN

2020 BEST PRACTICES AWARD



COPPER MOUNTAIN  
TECHNOLOGIES

**2020 GLOBAL  
VECTOR NETWORK ANALYZERS  
CUSTOMER VALUE LEADERSHIP AWARD**

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## Background and Company Performance

### *Industry Challenges*

Network analyzers providers are rising to the challenge as customer needs evolve and the Internet of Things (IoT) changes product manufacturing and how companies interact with suppliers and customers. With the proliferation of radio frequency (RF) and new product launches using different form factors, the use of vector network analyzers (VNAs) is increasing.

Although high-performance network analyzers have rich functionality, customers require systems that have key superior performance capabilities (e.g., frequency range, dynamic range, measurement speed) and offer reliable performance. Today, leading VNA market vendors have a comprehensive product portfolio covering frequency ranges of 0-26.5 gigahertz (GHz), 26.5-40GHz, 40-50GHz, 50-67GHz, and 67-110GHz. Major application areas for RF instrumentation include the Internet of Things (IoT), 5G, telecommunication, automotive, electronics manufacturing, aerospace & defense, semiconductors, and medical devices. Growth in these sectors will trigger the expansion of the VNA market.

However, high implementation costs are hampering market growth. There is a clear need for user-friendly VNAs by industries and engineers, especially those who are new to vector network analysis. Frost & Sullivan research reveals that price is less important to end users than VNA ease-of-use and customer support. Nevertheless, there is a balance threshold in the course of the development, performance, and price of the instrument. Cost-conscious customers are unwilling to compromise on performance. Successful instrumentation vendors must provide rapid and accurate measurements and wide dynamic range required for various applications. Offerings must also meet rigorous quality standards to ensure, prove, and trace key parameters.

Moreover, there is a rising adoption of VNAs for industrial mass-production chains. Such large applications require affordable testing costs and robust, highly portable instruments to validate RF component design and performance. Frost & Sullivan research reveals that economic and budget constraints are major challenges hindering the widespread adoption of VNAs. To that end, USB-based instruments have penetrated the market to cost-effectively meet IoT and 5G standards. With the market moving toward the manufacture of IoT and 5G products, there is an increasing demand for smaller, lower cost, and more automated instrumentation over the next 5 years. Moreover, superior customization options are required to improve existing VNA offerings.

Providers able to address the aforementioned challenges will find themselves best positioned to capture the growing revenue potential in the VNA market in the coming years.

### *Customer Impact and Business Impact*

Founded in 2011 and headquartered in Indianapolis, Indiana, Copper Mountain Technologies pioneered USB VNAs and today is a leading provider of RF test and measurement solutions. The company's value proposition is based on its comprehensive portfolio of portable and innovative VNAs up to 110 GHz. The company has also made

significant inroads towards serving a larger market by accommodating customers with different budgets.

### **Price/Performance Value**

The key to success for any company lies in offering customers the best price/performance ratio. Copper Mountain Technologies' solutions exhibit striking differentiation from traditional offerings. The company's compact and portable VNAs uniquely provide the highest value for money while providing the expected level of performance required for demanding production and laboratory settings.

Specifically, Frost & Sullivan finds Copper Mountain Technologies offers significant customer value through its recently-launched S5243 VNA offering. The product yields high-quality results at a more affordable price as compared with competing offerings. The S5243 VNA is a one-time purchase (software with advanced functionality included) at \$49,995, enabling engineers to procure a well-equipped test instrument within budget. In contrast, competitive offerings can range from \$50,000 to \$100,000. As a result, the company's new VNA provides the industry a uniquely affordable and fully capable solution. Moreover, such predictable and transparent price packages are increasingly desired by stakeholders.

The S5243 offering is an economically-priced, 2-port, 10 megahertz (MHz) to 43.5 gigahertz (GHz) compact VNA. As frequencies below 40 GHz are more actively investigated and utilized by small-to-medium-sized companies, the S5243 VNA is an optimal solution. The VNA can measure all four S parameters, including S11, S21, S12, and S22, and offers an easy-to-deploy test instrument. The device also provides superior measurement speeds of 15  $\mu$ s per point and typical dynamic range of 130 decibels (dB), allowing it to apply to the entire specified frequency range.

Overall, Copper Mountain Technologies' S5243 VNA delivers quality measurement and reliable results within a convenient and portable package that can be simply integrated into systems without significantly increasing testing costs.

### **Customer Purchase Experience and Customer Ownership Experience**

With the launch of the S5243 VNA, Copper Mountain Technologies is providing a cost-effective and optimal solution that can address the future needs of customers.

While cost is a significant driver for customers, Frost & Sullivan finds that a positive customer purchase experience is a strong indicator of long-term customer loyalty. In this regard, Copper Mountain Technologies excels. The company ensures end-to-end client satisfaction by supporting engineers who do not have a strong background in vector network analysis. In contrast to competing solutions, the S5243 VNA's size, form factor, and ease of automation are key areas praised by customers.

Copper Mountain Technologies' further differentiates itself by providing the measurement software that can run without license limitations on multiple PCs, laptops, or tablets, allowing users to connect to the measurement hardware via a USB interface. The S5243 VNA is controlled through the company's S2 software, which incorporates a breadth of

features (e.g., linear/logarithmic sweeps with multiple trace formats, power sweeps, time domain and gating conversion, frequency offset mode, test automation programming in LabView, Python, MATLAB, .NET) at no additional cost.

### **Customer Service Experience**

Copper Mountain Technologies focuses on providing a positive customer service experience by simplifying the installation process. As a result, clients avoid the need for costly professional services or specialized training. The company's ability to provide exceptional support, including acting as a subject matter expert resource, sets Copper Mountain Technologies apart.

Copper Mountain Technologies also understands that the industry shift from R&D to production environments requires flexible solutions. To that end, the company offers customization options along with its modular VNAs. As a result, customers can customize the analyzer module or extend the frequency range and performance of existing standard VNA models to support specific applications. Copper Mountain Technologies can easily change the form factor and location of connectors to accommodate customer needs and provide extra frequency ranges in comparison to standard VNAs.

Moreover, the company's customization approach allows for physical modifications to existing equipment to maintain the performance of the standard unit or develop a similar module based on specific customer requirements. The company can also support applications where it is only necessary for a single parameter to be enhanced. Frost & Sullivan appreciates that Copper Mountain Technologies can modify both the physical aspect and actual unit design to ensure devices address the specific parameters customers need.

### **Customer Acquisition**

Copper Mountain Technologies employs a range of strategies to significantly increase its customer acquisition. For example, the company offers a 12-month extended payment plan or a one-to-five year leasing pricing model for companies with low-capital budgets. At the end of the lease the company offers a buy option for \$1.00 and a lease termination fee of \$99, significantly less than competitors. The company also offers a 90-day deferred payment option and free trials to encourage product awareness, usage, familiarity, and, ultimately, adoption. Original equipment manufacturers widely appreciate Copper Mountain Technologies' leasing option as it enables them to acquire a high-performing VNA at an affordable price. Currently a growing client base for the company is US national research labs, companies engaged in 5G and materials measurement applications.

### **Growth Potential**

Copper Mountain Technologies is one of the fastest-growing VNA market participants with a more than 30% compound annual growth rate in the last 3 years. In contrast, the overall VNA market has been growing in the range of 4 to 5% year-over-year.

The company's goal is to expand its existing customer base by further extending its frequency range capabilities and developing VNA applications for untapped market

opportunities in the semiconductors, IoT, automotive, medical devices, aerospace & defense, telecommunications, consumer electronics, and energy sectors. Key applications include RF component and 5G testing, insertion loss measurement, antenna matching, quality control, and material measurements.

As Copper Mountain Technologies' has brought down the cost of its VNA technology, its customer base has grown markedly. The reduced price has opened doors for smaller customers with lower budgets, auguring well for the company's overall growth in the VNA market.

### *Conclusion*

Copper Mountain Technologies is one of the fastest-growing companies leading the vector network analyzers industry today. It stands out from its competition for offering high value solutions at an affordable price, which has opened up the scope of customers served to a much larger market. Demonstrating strong double-digit growth year-over-year, the company continues to gain traction as it supports more small-to-medium sized companies with budget limitations. Moreover, the company's innovative S5243 VNA meets the product design needs of customers across a range of industries, enabling enhanced speed-to-market and product validation.

With its strategic innovation, technical excellence, and uniquely cost-effective and high-value offerings, Copper Mountain Technologies earns Frost & Sullivan's 2020 Customer Value Leadership Award in the global vector network analyzers industry.



## Significance of Customer Value Leadership

Ultimately, growth in any organization depends on customers purchasing from a company and then making the decision to return time and again. Satisfying customers is the cornerstone of any successful growth strategy. To achieve this, an organization must be best in class in 3 key areas: understanding demand, nurturing the brand, and differentiating from the competition.



## Understanding Customer Value Leadership

Customer Value Leadership is defined and measured by 2 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 performance. This dual satisfaction

translates into repeat purchases and a lifetime of customer value.

### *Key Benchmarking Criteria*

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated 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**

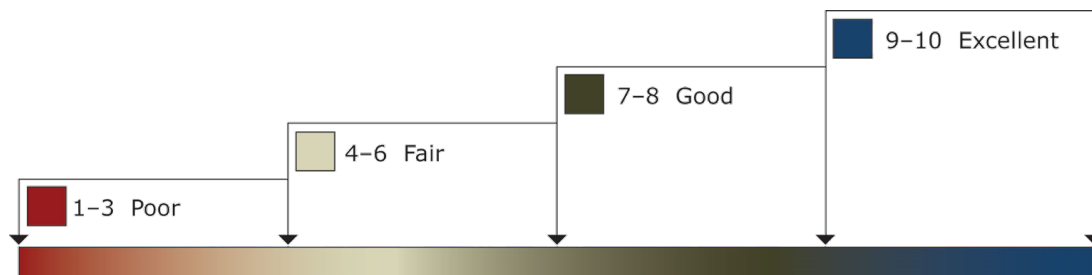
Criterion 5: Human Capital

## **Best Practices Award Analysis for Copper Mountain Technologies**

### *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



The Decision Support Scorecard considers Customer Impact and Business 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.

<i>Measurement of 1-10 (1 = poor; 10 = excellent)</i>			
<b>Customer Value Leadership</b>	Customer Impact	Business Impact	Average Rating
<b>Copper Mountain Technologies</b>	9.3	8.8	9.1
Competitor 1	8.5	8.5	8.5
Competitor 2	8.3	8.0	8.2

### *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.

### *Business Impact*

**Criterion 1: Financial Performance**

Requirement: Overall financial performance is strong in terms of revenue, 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**

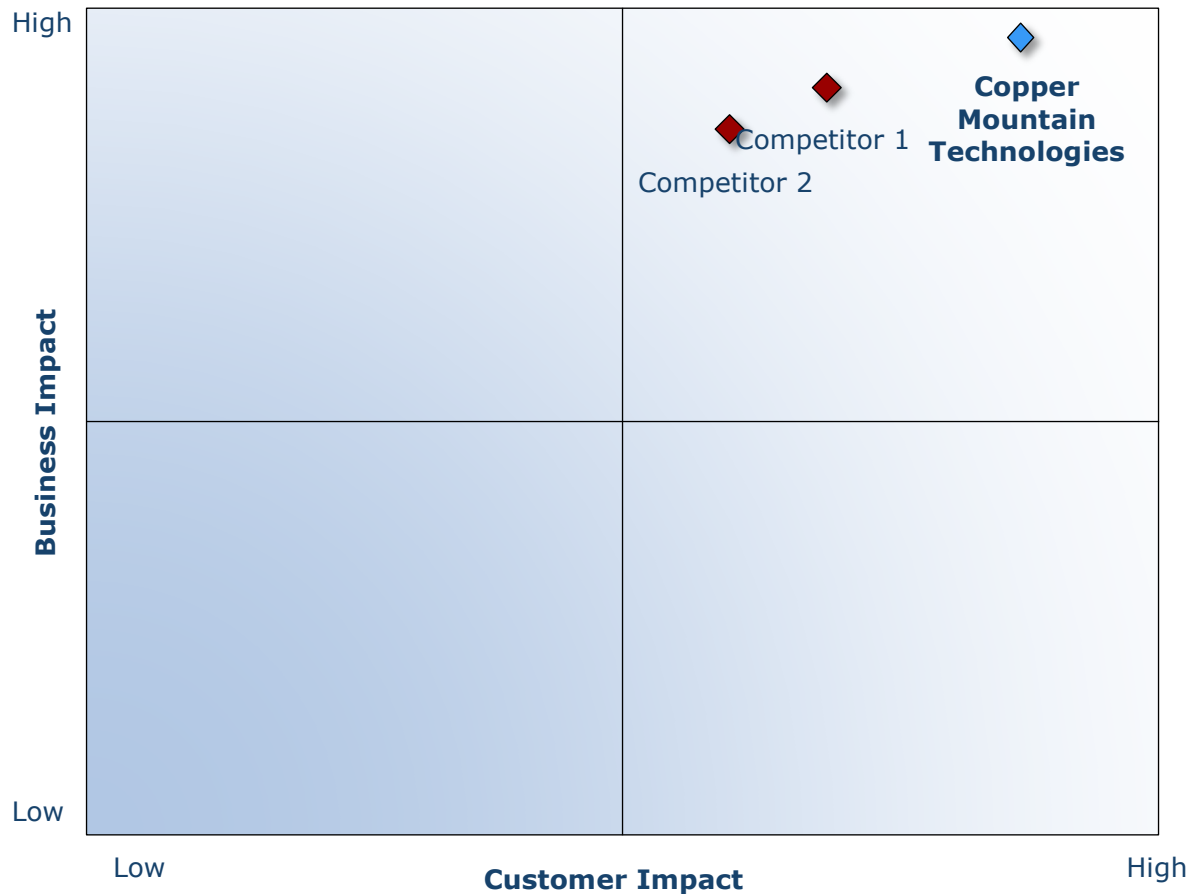
Requirements: Customer focus strengthens brand, reinforces customer loyalty, and enhances growth potential.

**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 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 practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 <b>Monitor, target, and screen</b>	Identify award recipient candidates from around the world	<ul style="list-style-type: none"> <li>• Conduct in-depth industry research</li> <li>• Identify emerging industries</li> <li>• Scan multiple regions</li> </ul>	Pipeline of candidates that potentially meet all best practices criteria
2 <b>Perform 360-degree research</b>	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> <li>• Interview thought leaders and industry practitioners</li> <li>• Assess candidates' fit with best practices criteria</li> <li>• Rank all candidates</li> </ul>	Matrix positioning of all candidates' performance relative to one another
3 <b>Invite thought leadership in best practices</b>	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> <li>• Confirm best practices criteria</li> <li>• Examine eligibility of all candidates</li> <li>• Identify any information gaps</li> </ul>	Detailed profiles of all ranked candidates
4 <b>Initiate research director review</b>	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> <li>• Brainstorm ranking options</li> <li>• Invite multiple perspectives on candidates' performance</li> <li>• Update candidate profiles</li> </ul>	Final prioritization of all eligible candidates and companion best practices positioning paper
5 <b>Assemble panel of industry experts</b>	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> <li>• Share findings</li> <li>• Strengthen cases for candidate eligibility</li> <li>• Prioritize candidates</li> </ul>	Refined list of prioritized award candidates
6 <b>Conduct global industry review</b>	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> <li>• Hold global team meeting to review all candidates</li> <li>• Pressure-test fit with criteria</li> <li>• Confirm inclusion of all eligible candidates</li> </ul>	Final list of eligible award candidates, representing success stories worldwide
7 <b>Perform quality check</b>	Develop official award consideration materials	<ul style="list-style-type: none"> <li>• Perform final performance benchmarking activities</li> <li>• Write nominations</li> <li>• Perform quality review</li> </ul>	High-quality, accurate, and creative presentation of nominees' successes
8 <b>Reconnect with panel of industry experts</b>	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> <li>• Review analysis with panel</li> <li>• Build consensus</li> <li>• Select recipient</li> </ul>	Decision on which company performs best against all best practices criteria
9 <b>Communicate recognition</b>	Inform award recipient of award recognition	<ul style="list-style-type: none"> <li>• Announce award to the CEO</li> <li>• Inspire the organization for continued success</li> <li>• Celebrate the recipient's performance</li> </ul>	Announcement of award and plan for how recipient can use the award to enhance the brand
10 <b>Take strategic action</b>	Upon licensing, company is able to share award news with stakeholders and customers	<ul style="list-style-type: none"> <li>• Coordinate media outreach</li> <li>• Design a marketing plan</li> <li>• Assess award's role in strategic planning</li> </ul>	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>.