2025 ENABLING TECHNOLOGY LEADER

Leveraging Vital Technology to Enhance Products and Applications

RECOGNIZED FOR BEST PRACTICES IN THE GLOBAL 4G/5G NETWORK OPTIMIZATION INDUSTRY

FROST & SULLIVAN

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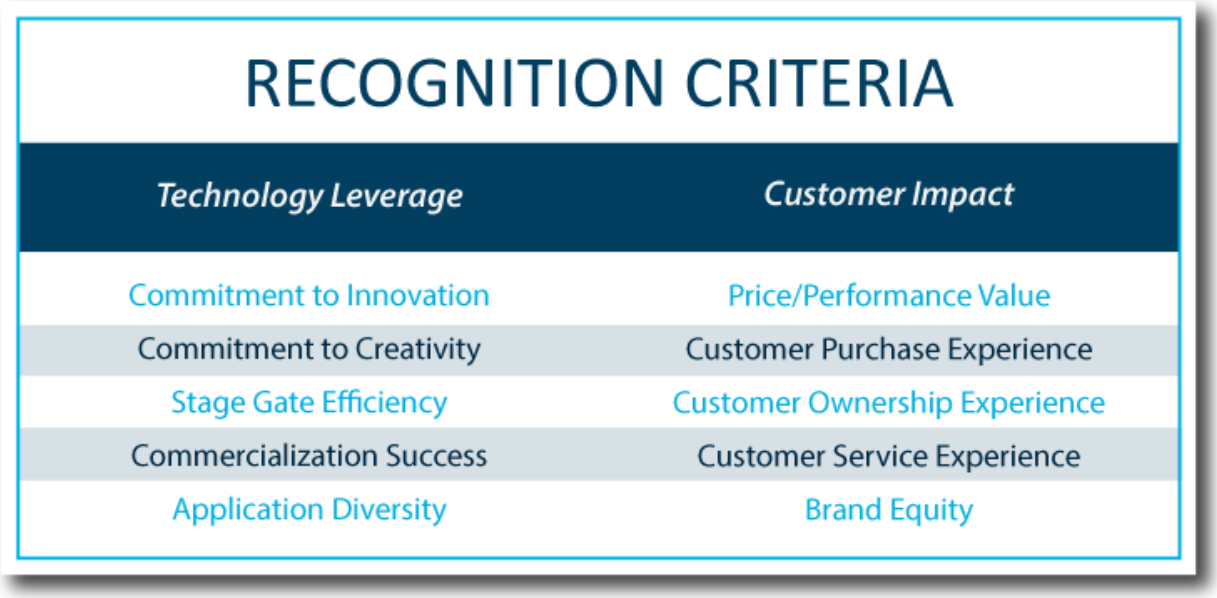
Best Practices Criteria for World-class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. DGS excels in many of the criteria in the 4G/5G network optimization space.



Optimization of 4G/5G Networks

As cellular technologies have progressed through the generations, users across the globe have come to expect their devices to "just work." With the fifth generation (5G) rolling out faster than the previous generation (4G) did, most in the world now have access to either 4G or 5G services. However, behind the scenes, there is a lot going on to enable these services.

Cellular technology uses radio frequency (RF) spectrum to transmit and receive data. What may not be obvious is that spectrum is a limited resource. Think of a specific RF channel as somewhat like a pipe that transports water. No matter how big the pipe is, there is a point at which it is at capacity and can accommodate no additional water. To continue the analogy, a pipe in perfect condition can transport a maximum volume of water in a given period, but any defect—whether a partial blockage (such as from sediment) or structural damage (such as a dent)—would reduce that capacity. Returning to RF, a specific RF channel has a limit to the volume of data that can be transmitted, even under the best conditions. The capacity of the RF channel is reduced if "imperfections" (such as interference) occur, affecting data-carrying capacity, reliability, and latency.

Spectrum is limited, but at the same time more and more devices are depending on spectrum to operate.[1] For cellular technologies, this has led to a continual expansion of available spectrum

[1] Cellular technologies are not the only users of RF spectrum, so there is ongoing competition between all users of RF spectrum to meet their individual needs.

ranges with each new generation. However, the combination of increasing numbers of users and devices and each using more and more data (and therefore more and more spectrum) means that optimizing 4G and 5G spectrum use is essential.

With the need for more spectrum and very little unused spectrum, there have been a number of schemes where cellular shares a spectrum band with legacy users of that spectrum. (In the past, governments[2] would clear out legacy users of spectrum to make room for new users, such as cellular; this has become much more difficult as the spectrum has filled up.)

In the United States, one example has been the CBRS spectrum, which ranges from 3.55 to 3.7 GHz, right in the middle of the most valuable mid-band spectrum. The CBRS spectrum is "shared" between incumbent users (primarily the US Navy), newly awarded license holders (up to seven per county), and everyone else. Access is managed by what is called the Spectrum Access System (SAS), which tries to reduce potential interference. The sharing mechanism does not use real-time information, which means that it is more of an allocation method and will struggle as CBRS use scales up. New ranges of spectrum in the United States that become available will require more advanced spectrum sharing approaches leveraging the lessons learned from CBRS. (Other countries are also watching CBRS to inform their own spectrum allocation.) Dynamic spectrum allocation also requires new technologies to effectively share spectrum and open new RF ranges to be used by 4G and 5G.[3]

At the same time that spectrum use must be optimized, the telecom world (and almost every industry in the world) is exploring how artificial intelligence (AI) can assist. Many types of AI are being explored—generative AI, agentic AI, and more, including what is commonly called machine learning (ML)—but the nomenclature is relatively unimportant. What is important is that AI/ML can be used to help optimize cellular networks and improve dynamic spectrum allocation.

Innovation and Creativity

Founded in 2013 and headquartered in Virginia, Digital Global Systems (DGS) specializes in RF spectrum monitoring and management. DGS has over 600 issued and pending patents to support its hardware and software solutions that provide persistent, real-time situational awareness of what is happening with spectrum at the radio access network (RAN) site and help optimize the use of that spectrum for wireless communications. Many of these patents are based on utilizing AI/ML for spectrum optimization.

One of DGS's solutions (and the subject of this award) is DGS CLEARSITE™, which provides a number of innovative capabilities highlighted below.

- **Spectrum utilization information**: Utilizing DGS's patented technologies, CLEARSITE™ provides a real-time view of devices using the wireless spectrum by monitoring frequency,

[2] Spectrum is controlled at the country level. Each nation controls its own spectrum and licenses the use of that spectrum, often for the equivalent of billions or hundreds of billions of dollars.

[3] During the last US administration, a landmark National Spectrum Strategy was released that focused on modernizing US spectrum policy. One of the pillars is the development of dynamic spectrum sharing to alleviate spectrum congestion.

time, and space, along with their signal characteristics. Without this crucial information, optimizing spectrum use is not possible. Spectrum is both limited and expensive; network operators must make the best possible use of it.

- **Interference analysis**: Interference happens, even in the best-engineered networks. DGS's solution automatically detects, characterizes, and locates any interfering signals, enabling the elimination of the problem and increasing network reliability.
- **Competitive benchmarking**: Communication service providers (CSPs) invest significant sums in their cellular network infrastructure and in licensing spectrum. CSPs in a particular country or area compete on "having the best network," but do not have a clear view into the drivers of their network performance (or that of other CSPs.) CLEARSITE™ provides deep insights into network performance and enables CSPs to remedy any performance shortfalls.
- **Infrastructure management**: Network infrastructure is a significant investment. DGS's persistent RF environmental data provides input data that helps optimize planning (and investment).
- **Dynamic spectrum sharing**: Spectrum sharing schemes (such as is done with CBRS) are not using real-time information and lack scalability. CLEARSITE™ provides up-to-date, real-time utilization statistics to both the RAN and the SAS, enabling true dynamic spectrum sharing and supporting the US government's National Spectrum Strategy.

DGS CLEARSITE™ uses AI/ML extensively to deliver enhanced customer value. For example, if interference occurs at a RAN site, the CSP knows fairly quickly that something is wrong. The more information that is available, the more likely the problem can be solved. CLEARSITE™ provides a wealth of information, and the CSP chooses how to use that information to resolve the problem. The AI/ML-enhanced product can provide information on what is wrong, classifications of the likely type of issue, and even recommendations on how best to resolve the issue—leaving CSP personnel to initiate the resolution. Best case, this means problems can be fixed in minutes or hours. In certain situations (and depending on the CSP), DGS CLEARSITE™ could utilize its AI/ML to resolve or reduce the issues being encountered itself—in this case, problems are fixed (or reduced) in seconds.

> *"The company has infused its RF monitoring expertise with creativity and innovation in the form of an AI/ML-enhanced DGS CLEARSITE™ to provide CSPs and enterprises with the information necessary to optimize their RANs and their use of spectrum, recommendations on how best use this information, and potentially the ability to resolve certain problems automatically."*
>
> ***- Troy M Morley***
> ***Industry Principal, ICT***

A Variety of Applications

The company has infused its RF monitoring expertise with creativity and innovation in the form of an AI/ML-enhanced DGS CLEARSITE™ to provide CSPs and enterprises with the information necessary to optimize their RANs and their use of spectrum, recommendations on how best use this information, and potentially the ability to resolve certain problems automatically.

Spectrum is the lifeblood of cellular networks, making it extremely valuable to

- CSPs whose existence depends on adequate spectrum;
- enterprises that are constructing private cellular networks to solve business problems that other technologies cannot solve; and
- cellular infrastructure suppliers and tower companies that work with CSPs and enterprises.

Spectrum is also expensive. Recent auctions of spectrum in the United States have raised many billions of dollars.[4]

CLEARSITE™ provides valuable and timely information (enhanced with AI/ML recommendations) that enables organizations to optimally utilize all of their spectrum and improve their network performance. CSP's biggest expenses revolve around their large number of RANs and the spectrum utilized by those RANs, making this solution a key need. However, CLEARSITE™ may be even more valuable to enterprises utilizing private cellular networks because these enterprises in general lack the RAN/spectrum expertise of the CSPs.

As the quality and reliability of the information and recommendations provided by CLEARSITE™ is proven in the real world, more and more of this spectrum optimization will be performed automatically.[5]

DGS believes the product and its technologies can make dynamic spectrum sharing possible. As new spectrum becomes available, it is likely that most of it will be shared, so improving the sharing mechanism with CLEARSITE™ is a win for all users.

CLEARSITE™ provides direct support for the dynamic spectrum sharing principles highlighted in the National Spectrum Strategy document issued by the National Telecommunications and Information Administration. Since the solution will detect an incumbent before the operating network is interfering, the incumbent can be protected through directions provided to the RAN.

CLEARSITE™ provides the information and recommendations needed to optimize the use of existing 4G and 5G spectrum, making it ideal for CSPs, enterprises deploying private 4G and 5G networks, infrastructure vendors (particularly RAN suppliers), tower companies, and more. While 5G did add spectrum for use, that spectrum is on pace to becoming congested. Most of the ecosystem that depends on spectrum cannot afford to wait till 6G (approximately 2030) for more spectrum: they must use the spectrum they have, as efficiently as possible, and CLEARSITE makes that possible.

[4] The C-Band auction in 2021, for example, raised more than $81 billion.
[5] CSPs tend to be conservative overall and need to be convinced that recommendations from CLEARSITE are consistent with what their own experts would recommend.

Customer Experience

Backed by over 600 issued and pending patents (as of September 2025), CLEARSITE™ is positioned perfectly to provide unique capabilities and needed RF information that CSPs need. The AI/ML enhancements to the solution add recommendations and, depending on the customer, can even provide some automated resolutions.

Optimizing spectrum use may not be a concern for the average person, but it grows more important with each passing day (at least for providers and users of public and private cellular networks). CLEARSITE™ provides essential information that no one else can, as well as recommendations and potential solutions to enable the cellular network to perform at optimum levels.

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Add in CLEARSITE's ability to improve spectrum sharing capabilities and the future is bright for DGS. The value of a brand can be hard to define, especially for a relatively young company with a new product. But when that product meets the needs of an entire ecosystem and is positioned as well as CLEARSITE™, Frost & Sullivan believes the result will be significant growth in the value of the company's (and the product's) brand.

Conclusion

Spectrum is the lifeblood of 4G and 5G wireless networks. At the same time, spectrum is a limited resource and only grows more valuable as more networks (public and private) are added and more devices consume the available spectrum. While allocating new spectrum takes many years, it is essential that every 4G and 5G network maximizes use of its existing spectrum and has the tools available to optimize performance. DGS CLEARSITE™ provides CSPs, enterprises, and others with real-time information, AI/ML-enhanced recommendations, and even automated solutions to make the most of their spectrum resources and keep their RAN assets operating at peak efficiency. CLEARSITE™ will also help improve the ability to more effectively share spectrum.

DGS earns Frost & Sullivan's 2025 Global Enabling Technology Leadership Recognition for its strong overall performance in the 4G/5G network optimization industry.

What You Need to Know about the Enabling Technology Leadership Recognition

Frost & Sullivan's Enabling Technology Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Recognition Analysis

For the Enabling Technology Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Customer Impact

Price/Performance Value: Products or services offer the best ROI and superior value compared to similar market offerings

Customer Purchase Experience: Purchase experience with minimal friction and high transparency assures customers that they are buying the optimal solution to address both their needs and constraints

Customer Ownership Excellence: Products and solutions evolve continuously in sync with the customers' own growth journeys, engendering pride of ownership and enhanced customer experience

Customer Service Experience: Customer service is readily accessible and stress-free, and delivered with high quality, high availability, and fast response time

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty, which is regularly measured and confirmed through a high Net Promoter Score®

Best Practices Recognition Analytics Methodology

Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company's long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

		VALUE IMPACT	
STEP		WHAT	WHY
1	**Opportunity Universe**	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	**Transformational Model**	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	**Ecosystem**	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	**Growth Generator**	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	**Growth Opportunities**	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	**Frost Radar**	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	**Best Practices**	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	**Companies to Action**	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

*Board of Directors, Investors, Customers, Employees, Partners

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The Growth Pipeline Generator™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fueled by the Innovation Generator™.

Learn more.

Key Impacts:

- **Growth Pipeline:** *Continuous Flow of Growth Opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*

The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- Megatrend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)