# FROST & SULLIVAN

## 2024

# ENABLING TECHNOLOGY LEADER

*IN THE ASIA-PACIFIC ARTIFICIAL INTELLIGENCE DATA CENTERS INDUSTRY*

**RED DOT ANALYTICS**

FROST & SULLIVAN

2024

BEST PRACTICES AWARD

# Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Red Dot Analytics excels in many of the criteria in the artificial intelligence data center (AIDC) space.

## AWARD CRITERIA

| Technology Leverage | Customer Impact |
| --- | --- |
| Commitment to Innovation | Price/Performance Value |
| Commitment to Creativity | Customer Purchase Experience |
| Stage Gate Efficiency | Customer Ownership Experience |
| Commercialization Success | Customer Service Experience |
| Application Diversity | Brand Equity |

## A Market Snapshot

The data center colocation industry has grown significantly in recent years due to increasing demand for data storage and processing capabilities. This demand has come from a variety of sectors, including public cloud service providers and other enterprise segments. The hyperscale component has driven demand from customers beyond public cloud service providers to over-the-top content, gaming, and banking verticals. Also, enterprises across industry verticals investing in digital transformation will need reliable data center infrastructure to support their data computing and processing requirements. Therefore, Frost & Sullivan's independent research expects a significant rise in capacity requirements over the next couple of years.[1]

> "As AI deployments require data centers to accommodate the unique demands of AI workloads in both design and operation, RDA has developed an offering that aligns with this industry trend. In addition, the company's product roadmap, which includes planning, development, and implementation strategies, considers clients' feedback to ensure that its portfolio effectively meets customers' evolving requirements."
>
> **- Nishchal Khorana**
> **Global Vice President and Program Leader: ICT**

In addition, the rapidly evolving AI technology and escalating use cases create new growth opportunities for data center service providers. The need to process large volumes of data in high-density facilities will

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[1] *Top 10 Growth Opportunities in Data Center Colocation Services: Providers Must Concentrate on Scaling Up Space and Power Capacities to Satisfy Hyperscale Demand* (Frost & Sullivan, January 2024)

necessitate data center service providers to undergo radical transformations in scale, design, and location. As a result, colocation service providers are expanding their space and power capacities and focusing on building best-in-class facilities in strategic locations while adopting tools and technologies to drive strategic differentiation.

Besides the need for cutting-edge facilities to manage AI workloads, the advancements in data center infrastructure management technologies, combined with the integration of artificial intelligence (AI), presents an opportunity for technology providers to develop powerful tools that can oversee multiple infrastructures, ensuring high availability, optimized energy efficiency, and efficient operational management. The convergence enables effective real-time management while anticipating and mitigating potential issues to prevent disruptions, resulting in a better customer experience. Thus, technology providers are increasing AI capabilities (e.g., AI-powered operation optimization solutions and AI-enabled data center infrastructure management software) to support data centers in building a sustainable value proposition and driving business value.

Within this context, Frost & Sullivan foresees that effective data center infrastructure management tools and customer-centric portals or solutions will be key success factors in the colocation industry. In particular, Frost & Sullivan reckons that providers who want to outperform competitors should focus on three key areas:

- A centralized view for data center management
- Easier application programming interface-based integration with enterprise software
- Converting large volumes of mission-critical data into user-friendly dashboards, enabling data center administrators or enterprises to make informed decisions

Also, Frost & Sullivan anticipates that tools providing increased visibility across platforms (by evaluating current and future data center infrastructure management demands) will be a game-changer.

### *A Trailblazer's Path*

Founded in 2016, Red Dot Analytics (RDA) is a deep-tech spin-off from Nanyang Technological University in Singapore. In collaboration with the National Supercomputing Center, Alibaba Cloud, and other companies in the region, RDA deployed its proof-of-concept technology to evaluate its application in managing mission-critical infrastructure. The technology connects the digital twin model to data center management systems, enabling the identification of hotspots in data center rooms while providing AI-engine-generated recommendations to reduce energy consumption actively. After successful validation, the company appointed industrial professionals to build the solution and secure commercial contracts in Singapore and Hong Kong.

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## Addressing Customer Needs through End-to-end Product Strategy

RDA pays close attention to the issues customers face and uses the insights gained to identify and explore growth opportunities. Artificial intelligence data centers (AIDC) require a high level of resilience and careful management of thermal risks. RDA's digital twin (DT) solution can validate sensitivity, identify risks, and improve the setup during the design and operation stages. AIDC also needs an ultra-high cooling density due to the high power density of graphic processing unit servers, which conventional air cooling cannot provide. As a result, an air-liquid hybrid cooling system is essential. RDA's solution offers industry-grade modeling and optimization for hybrid cooling setups, ensuring the necessary cooling density and capacity.

Notably, RDA's robust product strategy covers the full DC lifecycle, from design to building, operation, and maintenance. The entire technology stack comprises four layers. The first one is a vendor-agnostic infrastructure layer. The second one is a platform that integrates a DT that utilizes computational fluid dynamics and an energy engine. The third, an application layer, consists of configurable modules such as a co-simulation twin, cooling optimization, an energy manager, and predictive maintenance capabilities. The fourth one is a user-friendly presentation layer with a graphical user interface.

For design validation, DCVerse (i.e., the optimization platform) features a powerful AI engine and advanced physics-driven DT platforms that cover the complete spectrum of thermal and energy systems, including chiller plants, computer room air conditioners, liquid cooling CDS and piping, heat-exchange modeling at the chip level, and air-liquid hybrid cooling modeling. These capabilities empower customers to validate designs, identify risks, and recommend improvements at the design stage to achieve optimal resilience and efficiency.

> *"The company's brand strength, substantiated by over 18 technology disclosures and patents and 60+ scientific publications, supports its exceptional growth trajectory. Above and beyond, RDA's values anchor its commitment, customer-centricity, and unwavering focus on delivering tangible benefits."*
>
> *- Riana Barnard*
> *Best Practice Research Analyst*

To accommodate the demands of AI workloads, legacy DC with conventional air-cooling setups may require extensive customizations to provide cooling density and spacing out racks. RDA's DT platform enables accurate modeling, simulation, and analysis of all these variables for sensitivity, risk, and efficiency planning before deploying actual AI loads.

With its optimization platform that designs new and legacy data infrastructure for AI workloads, the company's unique value proposition sustains the transforming data center landscape. Frost & Sullivan believes RDA stands to reap the rewards of abundant demand.

## Customer-focused Growth Strategies

With its customer-centric philosophy, RDA operates on the central tenet that its success depends on customer satisfaction. This philosophy permeates the company's daily practices. For example, the optimization platform ensures it is risk-aware by validating its AI-powered recommendations through a high-fidelity Digitaltwin for risk and outcome assessment before prompting any action; therefore, RDA's solutions are always grounded in data-driven insights and best practices.

RDA provides its portfolio as both on-premises solutions and software-as-a-service offerings. Through cognitive digitaltwin (CDT)-driven comprehensive optimization, which enables full range and full lifecycle sustainability, RDA keeps its solutions up-to-date and prepared to meet the evolving needs of its clients.

To date, the company has deployed its predictive analysis and optimization capabilities across 10,000+ racks carrying 130 megawatt IT capacity to achieve 10% energy efficiency in savings within one quarter. As a result of its customer value enhancements, it has secured significant contracts from data centers in Singapore, Hong Kong, and Malaysia.

RDA recently signed a memorandum of understanding with Nxera, a newly launched data center brand of Singtel. The purpose of this agreement is to use RDA's predictive and simulation capabilities to monitor, manage, and optimize data center operations, leading to improved energy efficiency and operational resilience. The collaboration also includes other players in the ecosystem, such as NVIDIA, to support and advance the growing AI workloads in Southeast Asia through hyperconnected, eco-responsible data centers.[2]

RDA's consistent performance is paramount in building trust and cultivating loyalty with its clients:

*"Red Dot Analytics has been an essential partner on our path to sustainability and achieving NetZero. Its technology has optimized our data center's efficiency and significantly reduced our carbon footprint, ensuring we are on track to meet our environmental goals."*

**- Suppan Saravanamuthu: Director of Operations at Iron Mountain Data Centers, Asia-Pacific**

*"The sensitivity analysis provided by RDA's digital twin-based simulations has helped us validate our design choices for thermal risk and energy efficiency in the proposed colocation setup. Their simulations accurately predicted outcomes and recommended changes, enabling us to mitigate risks and optimize energy usage before deployment. This proactive approach not only ensured a smoother setup process but also laid the foundation for even more resilient and efficient datacenters in the years to come."*

**- Alan Wei, CEO of Aperia Cloud Services**

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Hosting AI workloads through advanced data center design and operations management capabilities, strengthened by best-in-class innovation and services, Frost & Sullivan finds RDA well-positioned to drive the AI data center space into its next growth phase, capturing market share and sustaining leadership in the coming years.

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[2] https://www.singtel.com/about-us/media-centre/news-releases/singtel-advances-ai-development-in-singapore-and-the-region-with
(Accessed February 2024)

## Conclusion

With the rapid adoption of artificial intelligence (AI), data centers will need to realign design and operation capabilities to address the unique needs of AI workloads. Datacenter service providers must invest in technologies that can create cutting-edge facilities. Red Dot Analytics (RDA) brings a compelling value proposition for data centers managing AI workloads. With its commitment to innovation reinforced by its customer-centric approach, the company delivers far-reaching impact and application, which positions it favorably in the data center ecosystem. Its optimization platform features a powerful AI engine and advanced physics-driven digital twin platforms that cover the complete spectrum of thermal and energy systems to validate designs, identify risks, and recommend improvements at the design stage for achieving optimal resilience and efficiency. Moreover, RDA's comprehensive product strategy covers the full data center lifecycle, from design to building, operation, and maintenance. Furthermore, it pairs its technology focus with customer-centric values, thus earning a solid reputation in the artificial intelligence data center market.

With its strong overall performance, Red Dot Analytics earns Frost & Sullivan's 2024 Asia-Pacific Enabling Technology Leadership Award in the artificial intelligence data centers landscape.

## What You Need to Know about the Enabling Technology Leadership Recognition

Frost & Sullivan's Enabling Technology Leadership Award recognizes the company that applies its technology in new ways to improve existing products and services and elevate the customer experience.

### Best Practices Award Analysis

For the Enabling Technology Leadership Award, 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 Success**: 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 provide the best value for the price compared to similar market offerings

**Customer Purchase Experience**: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

**Customer Ownership Experience**: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

**Customer Service Experience**: Customer service is accessible, fast, stress-free, and high quality

**Brand Equity**: Customers perceive the brand positively and exhibit high brand loyalty

# About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at http://www.frost.com.

## The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled 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:

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