ABI RESEARCH COMPETITIVE RANKING

WLAN FOR CAMPUS AREA NETWORKS

CISCO

OVERALL: 86.8 | INNOVATION: 89.4 | IMPLEMENTATION: 84.1 | RANK: 1

CISCO

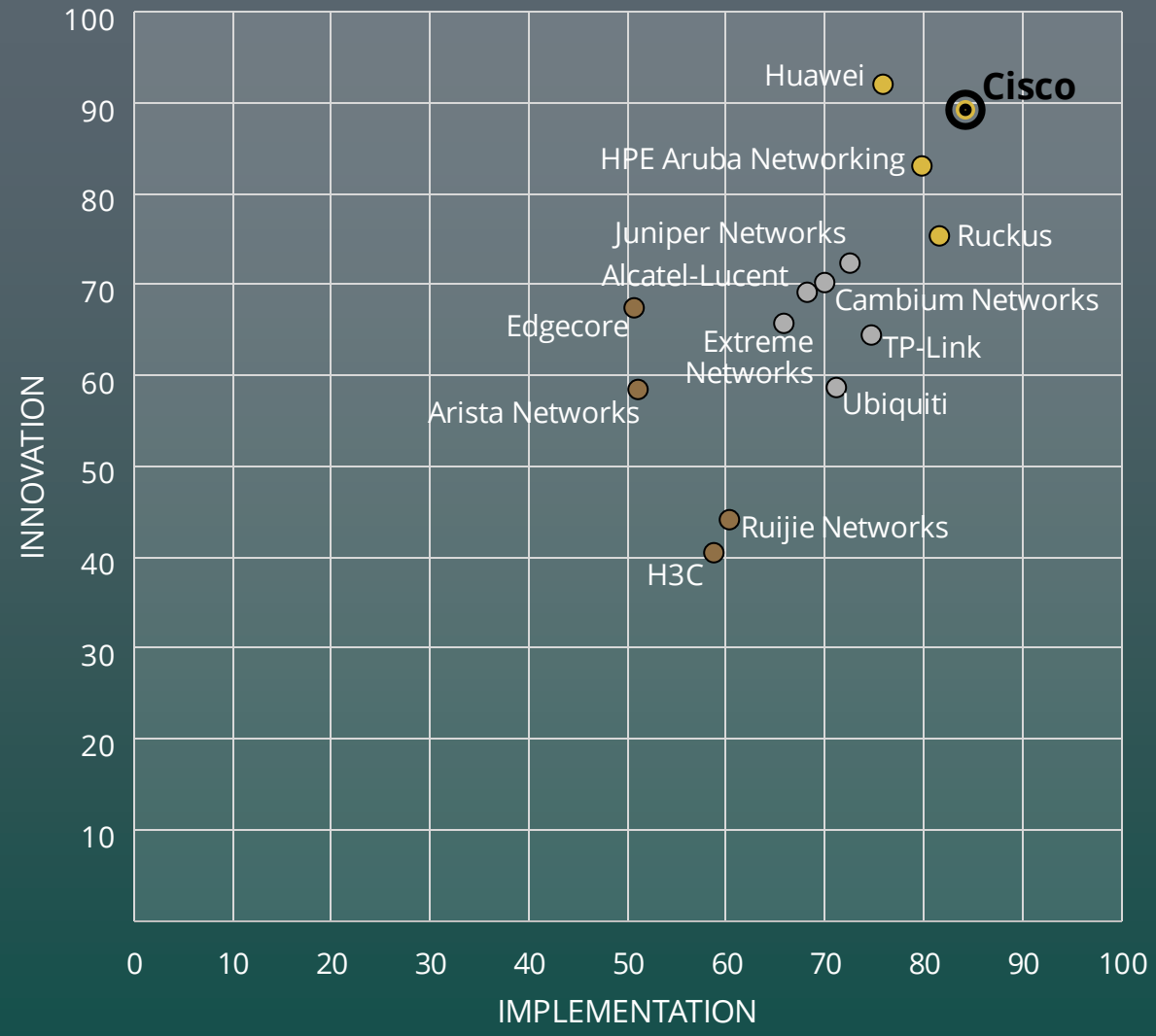
OVERALL LEADER
ABIresearch.

TOP INNOVATOR
ABIresearch.

TOP IMPLEMENTER
ABIresearch.

OVERALL: 86.8 | INNOVATION: 89.4 | IMPLEMENTATION: 84.1 | RANK: 1

INNOVATION VERSUS IMPLEMENTATION MATRIX



INNOVATION

INNOVATION SCORE: 89.4

Cisco is a major innovator within the WLAN industry and has a major influence on the direction of technological development. A key element of this is its deep involvement in industry standardization—in the field of data protection, for example, Cisco representatives occupy the vice chairs of the 802.11BI and 802.11BH Working Groups (WGs). Cisco is also an active member of open-source initiatives such as the Open AFC software group, and it was the original developer of the OpenRoaming framework for seamless and secure roaming between cellular and Wi-Fi (stewardship was handed over to the Wireless Broadband Alliance in 2020). Cisco has also been a driving force behind many industry trends, including recently the convergence between Wi-Fi and 5G, and the convergence between IT and Operational Technology (OT).

Cisco invested US$6.8 billion in R&D in the 2022 financial year, the highest total amount of any of the vendors assessed in this report. This number corresponds to a healthy 13.1% R&D intensity ratio. The development and implementation of many innovative proprietary technologies across its product line has helped Cisco effectively differentiate its solutions from those of its competitors and to generate additional value for customers. One such example is Fastlane+, possible through the company's unique partnership with Apple. With Fastlane+, when iOS devices run voice or video applications in environments with 60% or above channel utilization, an Advanced Scheduling Request (ASR) session will be formed between the client and the AP, allowing the network to intelligently estimate the client's Buffer Status Report (BSR), and through this maximize airtime efficiency. Other notable proprietary innovations include CleanAir, which minimizes wireless interference with self-healing and self-optimizing wireless networks, and Zero Wait DFS, a new feature that constantly monitors DFS channels to identify more efficient channel assignments.

Another notable proprietary technology that Cisco can deploy for campuses is Cisco Ultra-Reliable Wireless Backhaul (URWB, formerly Fluidmesh), a proprietary mesh technology that extends network coverage to areas without fiber. This is proving to be particularly useful for verticals such as industrial manufacturing, mining, and ports, which all contain mission-critical applications that cannot tolerate downtime.

Cisco has developed what is perhaps the most extensive and wide-ranging portfolio of WLAN APs in the industry, with models to address virtually every different enterprise scenario, across all verticals and all environments. Its solutions are spread across two main enterprise brands: Catalyst, which is orientated around on-premises management and contains Cisco's switching portfolio, and Meraki, which focuses on cloud-managed WLAN APs. A recent innovative AP released by Cisco is the Wi-Fi 6E Cisco Catalyst Wireless 9166D1, whose integrated directional antenna enables external antenna-like performance from an internal antenna. This will prove particularly valuable for campuses that require external antenna performance, but cannot use Automatic Frequency Control (AFC) systems (not yet authorized in most markets), or those that wish to decrease time to deployment. This AP, alongside other Wi-Fi 6E APs such as those in the Catalyst 9100 Series (9166, 9164, and 9162), gives Cisco the most wholistic Wi-Fi 6E range of any vendor in this assessment.

INNOVATION

INNOVATION SCORE: 89.4

Cisco also stands out among its peers as one of the few vendors with both solutions for enterprise IT and industrial OT environments. Cisco's range of heavy-duty APs include the high-end IP67 IW9167E, with 4x4 MIMO on up to 4 spatial streams, and the mid-range IP67 IW9165D with 2x2 MIMO on 2 spatial streams. As with all products in Cisco's industrial wireless portfolio, they support both 802.11 connectivity and Cisco's proprietary URWB. The high reliability of URWB has been well received by OT clients in verticals including mining and transportation. Cisco also ventured into new territory in 2023 with the launch of its first purpose-built client for industrial use cases, the IW9165E, a product that signals the company's intention to provide hardware serving deeper inside the OT network. Cisco also advanced the convergence between IT and OT within its network in 2023 through the integration of Cisco Cyber Vision and the Cisco IoT Operations Dashboard, which unlocked full visibility between the two domains and enabled a unified security posture across the entire network.

Cisco's network management platforms (the on-premise Catalyst Center for Catalyst APs, and the cloud-managed Meraki dashboard for the Meraki range) are both equipped with industry-leading features, such as advanced AIOps, which enable AI-driven Radio Resource Management (RRM) and network simulation with recommendations for performance improvements. These are then backed up by a multitude of additional services, ranging from automation and analytics to managed services and network security, which can be integrated into the platforms. Campus management is further facilitated and streamlined through Cisco's Software Defined Architecture (SDA) Fabric, which unites all elements of the network (wired, wireless, security) together in one stack, allowing for software-defined access and group-based policies.

Finally, sustainability is another domain in which Cisco has demonstrated industry leadership. Sustainability features include improving energy efficiency through the centralization of the conversion of power supply from Alternating Current (AC) to Direct Current (DC), and the ability to shut down radios to conserve energy when usage is low.

IMPLEMENTATION

IMPLEMENTATION SCORE: 84.1

Cisco held a 28.5% market share of total worldwide enterprise-grade WLAN AP shipments as of 2Q 2023, making it the largest vendor by a significant margin. This market share is actually up 1.7% from 2Q 2022, helped by the easing of the supply chain challenges that have plagued the company in recent years. The company has operations worldwide, with the Americas constituting roughly 60% of total business, Europe, the Middle East, and Africa (EMEA) approximately 26%, and Asia-Pacific the remainder. While Cisco's products may be some of the most expensive in the industry, they are also viewed as being at the leading-edge technologically, as having one of the most comprehensive portfolios available, and as having the ability to create value and deliver good ROI for customers.

Cisco has solutions to address virtually any business challenge within campus networking, a major strength for the company. There are numerous examples of the company's solutions being used for complex deployment scenarios. Virtual Reality (VR) company Zero Latency relies on the Cisco Catalyst 9160 series of Wi-Fi 6E APs and the Meraki Dashboard to generate rendering for optimized and immersive VR experiences. The California-based multi-day music festival BottleRock uses the Cisco 9104 integrated stadium antenna to connect tens of thousands of attendees to the network via OpenRoaming. General Motors (GM) is leveraging Cisco's proprietary URWB technology for real-time pre-production performance testing at the GM Milford Proving Ground. And one of the largest healthcare providers in Nevada, Renown Health, uses Cisco Spaces to monitor the location of staff, and to remotely manage IoT devices ranging from temperature control modules, Magnetic Resonance Imaging (MRI) and X-Ray machines, and medical devices. Cisco also operates two sub-brands aimed at small-scale SMBs, the Business Series APs line and the Meraki Go line; and to better serve remote and hybrid workforces, in 2023, Cisco entered into a partnership with AT&T to launch the new AT&T Business Wi-Fi with Cisco Meraki service.

Key features have been developed for Cisco's portfolio to specifically address common implementation challenges. To reduce the time required for deployment, APs can be pre-programmed via the cloud before an event, allowing them to be operational as soon as they are installed. And to mitigate the complexity of network design, the APs can automatically self-locate thanks to a combination of FTM and GNSS. The application of advanced AIOps also assists network performance, with features such as AI-enhanced RRM.

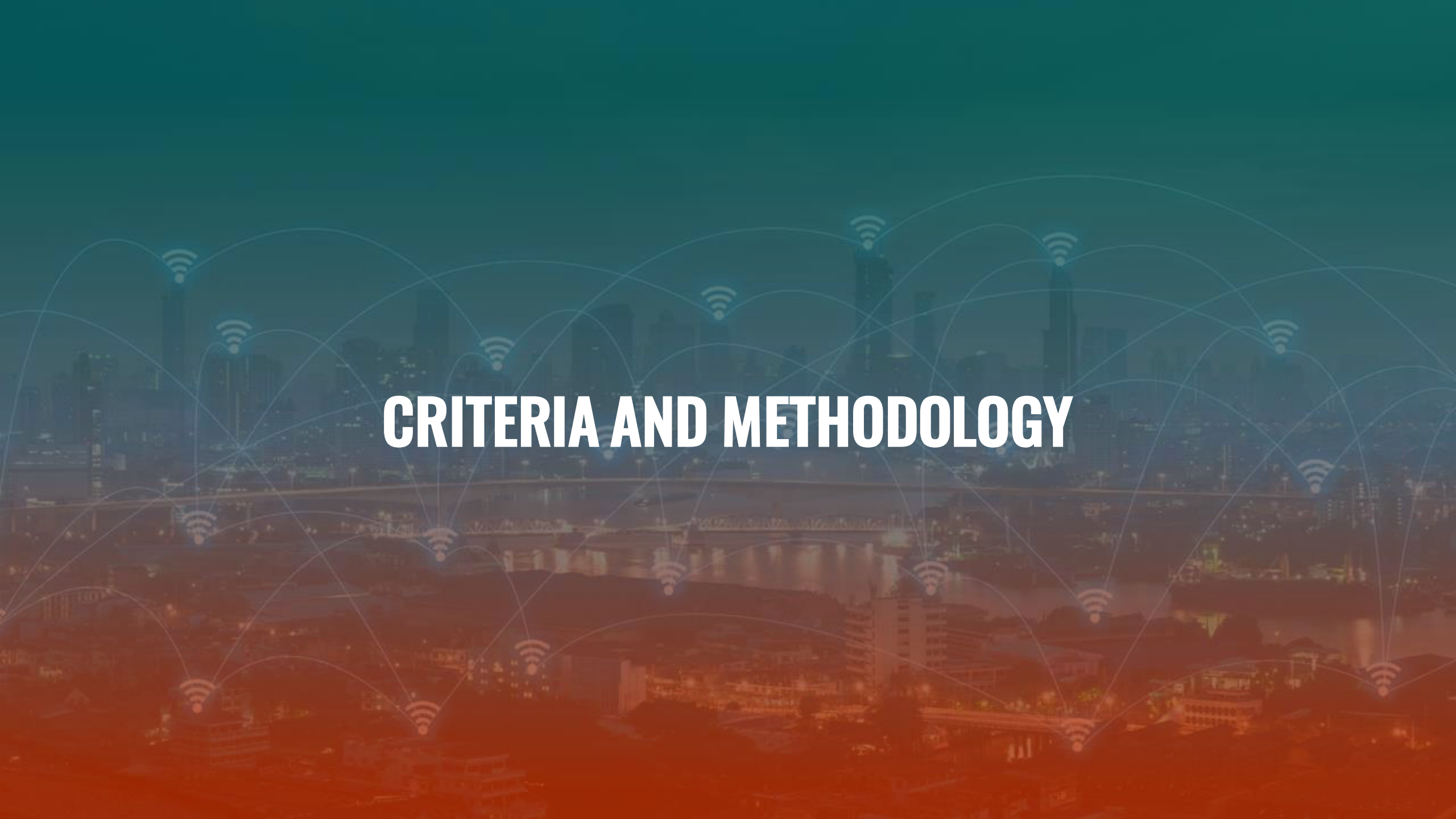
The implementation of Cisco's networks are further bolstered by the strong partnerships the company maintains with leading client device vendors such as Intel, Samsung, Zebra, and Apple. For example, a deep partnership with Apple enabled the development of the Fastlane+ feature, which brings significant performance improvements to iOS 14 and above devices on the network. Vertical-specific implementation is also supported through the integrations of platforms such as SplashAccess, a user-defined network solution that facilitates guest access in the hospitality, retail, and education verticals.

IMPLEMENTATION

IMPLEMENTATION SCORE: 84.1

Cisco has, in the past, faced criticism for the lack of interoperability between the separate Catalyst and Meraki network management platforms, and although they remain divorced from each other, considerable steps have been taken to ensure that customers can use the advantages of both simultaneously in their networks. This has been achieved by merging the Catalyst and Meraki engines, and introducing Cisco+ features aimed at supporting customers in leveraging both the On-Prem Catalyst and Cloud Meraki in their networks.

The plethora of additional services available for Cisco's network management platforms greatly improve campus network performance and addresses challenges that campuses face. Services include Cisco Identity Services Engine (ISE), a zero-trust network access control solution, Cisco Spaces (indoor location-based services platform), Stealthwatch (advanced network segmentation, alongside threat detection and response), and ThousandEyes (end-point visibility and analysis). Customers have the freedom to pick and choose which services are the best fit for them, and the recent expansion of the Cisco+ NaaS solution to a greater portion of Cisco's portfolio has also enabled customers to access Cisco's products and services via an OPEX model.



CRITERIA AND METHODOLOGY

VENDOR MATRIX

Methodology: After individual scores are established for innovation and implementation, an overall company score is established using the Root Mean Square (RMS) method:

$$Score = \sqrt{\frac{innovation^2 + implementation^2}{2}}$$

The resulting overall scores are then ranked and used for percentile comparisons.

The RMS method, in comparison with a straight summation or average of individual innovation and implementation values, rewards companies for standout performances.

For example, using this method, a company with an innovation score of nine and an implementation score of one would score considerably higher than a company with a score of five in both areas, despite the mean score being the same. ABI Research believes that this is appropriate as the goal of these matrices is to highlight those companies that stand out from the others.

RANKING CRITERIA

Leader: A company that receives a score of **75 or above** for its overall ranking

Mainstream: A company that receives scores **between 60 and 75** for its overall ranking

Follower: A company that receives a score of **60 or below** for its overall ranking

Innovation Leader: A company that receives a score of **75 or above** for its innovation ranking.

Implementation Leader: A company that receives a score of **75 or above** for its implementation ranking.

INNOVATION CRITERIA

Technological Leadership & Influence: Vendors developing leading-edge 802.11 solutions for campus networks will score highly in this criterion. Such vendors will have evidenced significant product differentiation through 802.11 innovation and are pushing the boundaries of what the technology is capable of. Being at the vanguard of 802.11 innovation often goes hand in hand with influence on the development of the technology, so vendors' contributions to standardization efforts, involvement in technology trials, or participation in industry initiatives will also be considered.

Campus-Specific Innovations: This criterion is an assessment of proprietary technologies that have been designed to meet the demands of campus networks. These solutions do not necessarily have to be cutting-edge and could potentially be existing technologies that have been reengineered for campus use cases. The key is that these innovations are unique and have been developed with the explicit purpose of effectively addressing campus-related challenges.

Simplicity & Ease of Management: Growing network complexity is raising the need for tools that simplify the management experience for campus operators, and this category will analyze a vendor's ability to deliver these resources, not only regarding network control, but also in aspects such as network intelligence and scalability. The grading will look favorably upon management platforms that can provide unified control of the network, can support operations with insights, analytics, and automations, and those that are seamlessly scalable. Innovations made to support Managed Service Providers (MSPs) in managing the campus networks of their clients will also be considered.

IoT & Cellular Technology Integration: A successful integration of WLAN with the Internet of Things (IoT) or 5G hinges on the ability to ensure that the integration is frictionless, and that the advantages of multiple technologies can be effectively leveraged to resolve campus challenges. A vendor scoring highly in this field can demonstrate its ability to provide unified and centralized management of the integrated technologies and can highlight innovative use cases for which the converged solutions are applied.

Services & Applications for Campus: Additional value-added services on top of platforms, such as location-based services or digital twins, can unlock new abilities that support the operations of campus networks. Such services may be included within product licenses or can be sold separately via application marketplaces. The final criterion in the innovation section will assess the provision of such services by WLAN vendors, with a focus on those that have been engineered specifically for campus networks. Vendors scoring highly will be those with especially innovative services optimized for delivering campus optimizations or addressing campus-specific challenges.

IMPLEMENTATION CRITERIA

Fulfillment of Next-Generation Campus Demands: Rapid increases in client density, higher performance requirements, growing demand for roaming, and the introduction of new ultra-high reliability applications are just some of the trends with which next-generation campus networks must grapple. This criterion will assess a vendor's capacity to satisfy these advanced performance demands, and whether they can support Information Technology (IT) departments and MSPs in delivering the guaranteed Quality of Service (QoS) necessary for modern campus Service-Level Agreements (SLAs).

Business & Service Model Innovation: Accelerating technological innovation, growing network complexity, shrinking IT budgets, and challenges in sourcing qualified network engineers are straining the ability of businesses and public sector bodies globally to manage campus WLAN networks. WLAN vendors will also be graded on their ability to support their customers in facing these challenges with innovative business and service models, including the implementation of Hardware-as-a-Service (HaaS) or NaaS packages.

Campus Vertical Coverage: Campus networks are used in an extensive range of different industries, each of which poses its own unique and distinct requirements. Key sectors include traditional enterprise, SMBs, education, government, hospitality, retail, large public venues, healthcare, and industrial. On account of the differing strategies of ecosystem vendors, high scoring vendors in this category will either have a broad breadth of vertical coverage or can demonstrate leadership in their target vertical(s).

Overall Value Proposition: This criterion grades the complete value-proposition of a vendor's solution for campus environments, taking into consideration several key factors. The first indicator of a strong value proposition is Total Cost of Ownership (TCO) competitiveness and evidence of offering a strong Return on Investment (ROI). A second metric is the ability to provide an E2E solution for campus networks, delivered either through a vendor's own proprietary platforms or via strategic partnerships. Also encompassed in this category is support for lifecycle management of the campus network.

Strength of Partnerships: Strategic partnerships are key for both enhancing a vendor's competitive edge and for executing the go-to-market of products. Therefore, the final category will analyze the relationships that a vendor maintains with third parties, and how effectively it can leverage these partnerships for the needs of campus networks. Examples of strategic partners include MSPs, System Integrators (SIs), hardware component suppliers, or value-added service vendors.

Originally Published November 2023

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