

HPE Recognized as the

2021

Enabling Technology Leadership

Global 5G Network Infrastructure

Excellence in Best Practices



Hewlett Packard
Enterprise

Strategic Imperatives

Frost & Sullivan identifies three key strategic imperatives that impact the 5G industry: disruptive technologies, innovative business models, and geopolitical chaos. Every company that is competing in the 5G space is obligated to address these imperatives proactively; failing to do so will almost certainly lead to stagnation or decline. Successful companies overcome the challenges posed by these imperatives and leverage them to drive innovation and growth. Frost & Sullivan’s recognition of HPE is a reflection of how well it is performing against the backdrop of these imperatives.



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. HPE excels in many of the criteria in the global 5G network infrastructure space.

AWARD CRITERIA	
<i>Technology Leverage</i>	<i>Customer Impact</i>
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

The analysis of HPE is based on research that resulted in the recently released report on 5G network infrastructure and 20 global suppliers in that market.¹

The 5G era is here and expected to unfold over the next decade or more. The 5G era brings with it a number of new directions for the telecom industry that are both exciting for the possibilities they bring, but also a bit scary as these new directions are not without risk. Telecom networks are moving to the cloud. Network functions have been virtualized and now are being designed explicitly for the cloud. Formerly proprietary interfaces are being standardized; “opening” up what in the past were closed systems. The 5G core network is now “open” and there is a strong push for the 5G radio access network or RAN to follow suit. Some network functions are being pushed to the “edge” of the network, closer to the virtualized RAN and to the devices utilizing the RAN.

These trends have increased the number of suppliers providing communications service providers or CSPs with their network infrastructure. The upside is that innovation is increasing, and costs are decreasing. The downside is increased risk from integration.

Prior to a look at the award criteria, an examination of HPE in the context of this market is in order.

Hewlett Packard Enterprise Profile

Publicly traded Hewlett Packard Enterprise is a global technology company headquartered in Palo Alto, CA. Formed in 2015 when the former Hewlett-Packard spun off HPE, the company trades on the NYSE under the symbol HPE. For FY 2020,² the company reported total revenue of almost \$27 billion. The company employs approximately 61,000 people and has a global customer base.

¹ See Frost & Sullivan report *Disruptive Technologies Powering the Global 5G Network Infrastructure Market, 2020: Growth Opportunities Abound as the 5G Era Unfolds*, December 2020.

² HPE maintains a fiscal year that ends October 31, so FY 2020 ended on October 31, 2020.

HPE is one of the 5G network infrastructure suppliers profiled in the Frost report but approaches the market in a way that is unique and helps to reduce the risk in 5G deployments.

The company supplies the “infrastructure for the infrastructure.” What this means is that HPE provides both the hardware that the telco cloud operates on and the software that enables the various cloud-based networks to function and be managed—the infrastructure that network functions operate on, referred to as network function virtualization (NFV) infrastructure or NFVI.

To help its customers design their 5G-ready networks, the company offers what it calls HPE Telco Blueprints. According to the company, these blueprints are “reference designs validated by HPE telecommunications experts leveraging infrastructure as code principles and HPE NFV best practices...Designed to enhance every layer of the NFVI stack, HPE Telco Blueprints enable scalability via modularity, reliability with no single point of failure, and accelerated performance.” HPE provides blueprints for both the core network and the edge network, including blueprints optimized for virtual RAN configurations.

In addition to hardware and NFVI software, HPE offers a set of key 3GPP-compliant 5G core network functions that are cloud native and based on a container- and microservices-based architecture. HPE offers a full suite of orchestration and management solutions which enables key 5G needs such as network slicing. This includes a new offering—the HPE Resource Aggregator for Open Distributed Infrastructure Management—to simplify management of multi-vendor, heterogeneous, distributed compute, storage, and data networking infrastructure with the scalability and flexibility that such deployments require.

HPE partners with a number of other suppliers both publicly and behind the scenes, increasing the number of network functions it offers pre-integrated for the 5G core, edge, and RAN.

Additionally, HPE embarked on a new corporate strategy called HPE Greenlake. Over the next few years, HPE plans to become a “consumption-driven” company; everything the company delivers will be available as-a-service, which also helps reduce risk for their customers.

Technology Leverage: Commitment to Innovation

Global standards are the basis for 5G. The 3GPP organization unites seven telecommunications standards development organizations and is the face of the 5G standards. Work on 5G standards began in 2012 and includes the contributions of many suppliers and CSPs.

To leverage technology with regard to 5G, a supplier must be actively involved in the standards organizations. In addition, as HPE provides the “infrastructure for the infrastructure”, HPE must be involved in, and in some cases lead, those standards organizations that define the lower-level networking and information technology infrastructure.

To support its commitment to innovation, HPE is involved in a long list of standards organizations. HPE is actively involved with the 3GPP and its efforts with 5G. An example of involvement with lower-level standards is HPE involvement with DMTF which was formerly known as the Distributed Management Task Force; HPE is a board member of this organization. DMTF “creates open manageability standards spanning diverse emerging and traditional IT infrastructures including cloud, virtualization, network,

servers and storage. Member companies and alliance partners worldwide collaborate on standards to improve the interoperable management of information technologies.”

By actively engaging with the 3GPP and other standards organizations, HPE has been involved with emerging technologies that it has used to enable new products and enhance its products performance.

Technology Leverage: Commercialization Success

This criterion requires “a proven track record of taking new technologies to market with a high rate of success.” While HPE as a legal entity is relatively new, the company has been involved with the communications service provider market for many decades. The company also supports a range of industries outside of communications and has for a long time. Decades of success in telco and outside of telco provide a convincing track record.

In the telco infrastructure market, HPE shared with Frost & Sullivan that it believes it is at or near the top of a number of market segments and claims over 450 thousand shipments of servers worldwide.

HPE also has a consulting and services organization (HPE Pointnext). The company shared that HPE Pointnext has engaged in over 11,000 projects that resulted in 99.8% “satisfied engagements,” an exceptionally high rate of success.

The 5G era and its disruptive technology challenges bring with it an increase in the number of suppliers particularly in the network core/edge and the RAN. The upside is that innovation is increasing, and costs are decreasing. The downside is increased risk from integration. One of HPE primary focuses—and one

large reason for their success—is reducing risk for their customers as they move into the 5G era.

“HPE is a 5G network infrastructure supplier of core and edge network functions, but they are much more than that alone. Their approach to the market is unique and helps their customers reduce risk when deploying 5G.”

- Troy M Morley, Senior Industry Analyst

Technology Leverage: Application Diversity

The requirement for this criterion is the “development and/or integration of technologies that serve multiple applications and can be embraced in multiple environments.”

HPE is different than the other suppliers profiled in the recent Frost & Sullivan report in that the company

supplies the “infrastructure for the infrastructure.” What this means is that HPE provides both the hardware that the telco cloud operates on and the software that enables the various cloud-based networks to function and be managed—the NFV infrastructure or NFVI. Put another way, NFVI is a telco cloud platform which network functions and other applications are deployed on.

HPE’s NFVI is not just for 5G and not just for telco. HPE has many enterprise customers in other industries that utilize its NFVI offerings. In the telco world, HPE offers NFVI solutions that support 5G networks, as well as previous generations of networks.

In addition to hardware and NFVI, HPE supplies network function software, including network functions that are part of the 5G core and edge networks. (In this way, HPE does compete more directly with other suppliers in the report. The company provides the infrastructure behind 5G RAN, transport

networks, and core (and edge) networks, but also provides network software that makes up the 5G core and edge networks.)

Customer Impact: Customer Ownership Experience

Customers that have a good ownership experience tend to remain as customers, and often buy more goods and services from a supplier they know can deliver on the promises made at the time of contract signing. This is true if one is talking of relatively inexpensive consumer products, and it is definitely true within the telecom network world where price tags often run into the millions of dollars.

Leadership in the network infrastructure market (or in any market) is only maintained if a company keeps its existing customer base happy; continuing to spend money, year after year. The 5G era is just beginning. When a service provider chooses to invest in 5G Infrastructure solution with the company that provided their 4G solutions, that tends to indicate a positive customer ownership experience. In addition, the CSP community and the analyst community are both relatively small and unhappy service providers are noted throughout the industry, sometimes for an extended time.

HPE has a long list of customers, both for 5G Infrastructure and for previous generations of infrastructure needs, as well as for industries outside of the communications industry. Frost & Sullivan's knowledge of the HPE's customer ownership experience is well founded based on several customer testimonials, continued press from the company that identifies CSPs by name, and the ongoing

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discussions Frost & Sullivan has had with both HPE and its competitors. Together, these facts indicate that HPE is keeping its existing customers happy as it continues to gain new ones.

Customer Impact: Customer Service & Purchase Experience

These two criteria strongly correlate with the Customer Ownership Experience criterion above.

More precisely, when a supplier delivers good service to its client customers (including during the purchase process), such clients tend to continue to do business with that supplier. The purchase experience starts the ownership experience—for good or for bad—and the service experience directly colors the ownership experience, positively or negatively.

If customers are satisfied with what they have received from an existing supplier, for instance 4G infrastructure needs, they are more likely to procure new solutions like 5G infrastructure solutions from the same supplier.

The ownership experience is negatively affected if the customer has a poor purchase experience or if the customer's service experience proves to be much less than expected. A company must keep its existing customer base happy in order to convince its customers to spend on new solution upgrades or service enhancements.

Satisfied customers also serve as a positive force when explaining to new prospects why they are satisfied with a particular solution suppliers' capabilities. For new customers to sign up for solution

delivery, and then remain existing customers, all facets of the engagement are important—the initial purchase experience, the ongoing service and ownership experience and the positive market experience that comes when multiple customers with the same business needs and solution capabilities talk with each other.

With regard to HPE, Frost & Sullivan's knowledge of the customer ownership experience, and by correlation the customer service experience and customer purchase experience, is well founded. The company continues to report CSP clients by name in press releases, has shared with Frost & Sullivan a number of in-depth case studies that identify details about its relationships with its customers and the solutions they have deployed, and continues to actively engage with the analyst community, including Frost & Sullivan. These facts, and others, provide a strong indication that HPE is managing its existing customer base well as it continues to show the value it can provide with new ones.

HPE also has a consulting and services organization (HPE Pointnext). The company shared that HPE Pointnext has engaged in over 11,000 projects that resulted in 99.8% “satisfied engagements,” an exceptionally high rate of success.

Conclusion

Frost & Sullivan recently completed its assessment of the 2020 5G Infrastructure market and of 20 key suppliers that control a significant portion of that market. Frost & Sullivan defines 5G network infrastructure to include the following: radio access networks, transport networks, and core networks, which may include one or more edge networks.

HPE is one of these 5G network infrastructure suppliers but approaches the market in a way that is unique and helps to reduce the risk for its customers in 5G deployments. The company supplies the “infrastructure for the infrastructure,” as well as key network functions for 5G core/edge networks.

For its accomplishments in providing the foundations for 5G network infrastructure needs around the world, HPE is recognized with Frost & Sullivan’s 2021 Enabling Technology Leadership Award.

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

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The Growth Pipeline Engine™

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

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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 six 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)**

