

*Chunghwa Telecom Recognized for*

**2021**

**Customer Value Leadership**

Taiwan Private 5G Network Industry

*Excellence in Best Practices*



中華電信

Chunghwa Telecom

## 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. Chunghwa Telecom excels in many of the criteria in the Taiwan private 5G network space.

AWARD CRITERIA	
<i>Business Impact</i>	<i>Customer Impact</i>
Financial Performance	Price/Performance Value
Customer Acquisition	Customer Purchase Experience
Operational Efficiency	Customer Ownership Experience
Growth Potential	Customer Service Experience
Human Capital	Brand Equity

### Market Drivers and Challenges for CSPs in Taiwan’s Private 5G Network Market

The COVID-19 pandemic has accelerated the digital transformation for enterprises in Taiwan. Enterprises are adopting cloud, Internet of Things (IoT), and edge technologies, and a private 5G network will accelerate the adoption of disruptive technologies and ensure the quality of service that enterprises are demanding. The private 5G network is a wireless local area network (LAN) that utilizes 5G technologies to create a dedicated network to address enterprise connectivity needs. Communication service providers (CSPs) in Taiwan will continue to dominate the private 5G network market, in terms of the number of deployments, because of their access to spectrum and expertise. The local government freeing up spectrum bands for industry use has increased the number of participants, threatening CSPs’ market positions. The rise in the number of participants and spectrum initiatives in

the market has shifted business models, resulting in the increased availability for enterprises to deploy the private cellular network.

Although private 5G networks can enable new use cases across vertical industries and address connectivity needs, enterprises still face challenges in deploying private 5G networks. Many enterprises are unfamiliar with the preparatory stages of a private 5G network, while some lack the experience and expertise in building, operating, and managing private 5G

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networks because the technology is still nascent and complicated. The lack of specialist radio technicians and expertise within an enterprise requires outsourcing and partners with industry-specific expertise, increasing the initial investment for a private 5G network.

CSPs are strongly positioned to expand and enhance their offerings to enterprises in the market. CSPs are often the first to receive licensed spectrum for the 5G network, allowing them to lead and play a crucial role in future private 5G network deployments. Leading CSPs in Taiwan are developing private 5G services that cater to enterprise needs by easing and simplifying network deployment and maintenance.

### ***Operational Efficiency***

The COVID-19 pandemic has altered the way enterprises work and operate, with increased demand for applications and remote operations that require higher bandwidth, lower latency, and reliability, all of which private 5G networks can offer.

Founded in 1996, Taiwan-based Chunghwa Telecom recognized the growth opportunities and thus prioritized its enterprise segment and contributes to the digital transformation of enterprises in Taiwan. To strengthen its capabilities, Chunghwa Telecom launched its research and development (R&D) center called Chunghwa Telecom Laboratories to address enterprise needs. For instance, the rise of open radio access networks (O-RAN) promises greater efficiencies in telecom network operations; therefore, Chunghwa Telecom has actively participated in O-RAN research and activities, such as cloud-based technologies for networking and software virtualizing. Chunghwa Telecom's strong R&D efforts enable the company to enhance its system integration capabilities, which are highly crucial for the deployment of a private 5G network. Frost & Sullivan finds Chunghwa Telecom's ability to capture emerging growth opportunities impressive and commends the company for staying ahead of the curve with its robust R&D initiatives.

### ***Customer Acquisition***

A lack of understanding, expertise, and investment to deploy the network themselves are among enterprises' key challenges in the private 5G network market. Recognizing enterprise needs, Chunghwa Telecom is committed to building up the always broadband-connected infrastructure, which includes 5G network, multi-access edge computing (MEC), software-defined network, cloud, network function virtualization, and information security. Chunghwa Telecom understands the importance of a robust ecosystem for the private 5G network and thus focuses on strategic partnerships to address different components of enterprise needs and accelerate the deployment of the private 5G network. For instance, in 2020, under Chunghwa Telecom Laboratories, the company's R&D achievements included the launch of its edge computing system and its strategic collaboration with Amazon Web Services (AWS) Outpost to enhance edge computing solutions.

Additionally, Chunghwa Telecom strengthens its solutions for the enterprise segment by partnering with cloud providers, such as Microsoft, to develop and launch the multi-cloud management system. With the Microsoft partnership, Chunghwa Telecom became the first certified CSP with the highest level of Azure Expert MSP in Greater China. By providing integrated edge computing and cloud capabilities, Chunghwa Telecom delivers significantly expanded value to enterprises in deploying a private 5G network.

### ***Growth Potential***

5G is a disruptive technology that significantly impacts the market. Traditional and wired networks, such as public networks, are sufficient for most enterprise applications; however, advanced use cases and mission-critical applications require 5G capabilities, such as lower latency, higher bandwidth, and capacity. Chunghwa Telecom has been at the forefront of deploying 5G technology for commercial and enterprise use and was the first CSP in Taiwan to receive a license for 5G services. In 2020, the company launched 5G services, with an expected 10,000 5G stations across the country by the end of 2021.

Chunghwa Telecom has prioritized working with small-to-medium enterprises to drive Industry 4.0 automation by providing secure 5G coverage in business and tourist districts. Additionally, Chunghwa Telecom has its own in-house multi-MEC solution that will be a crucial component for the future deployment of private 5G networks. For instance, in August 2021, Chunghwa Telecom partnered with AAEON and NTUST to build a testing and validation site for smart manufacturing applications utilizing a private 5G network, with MEC to maintain the network.

Frost & Sullivan applauds Chunghwa Telecom for its extensive developments with disruptive technologies and in-house capabilities, such as 5G, cloud, and MEC, that will drive the private 5G network market.

### ***Customer Purchase Experience***

The private 5G network is highly complicated to build and manage, and many enterprises currently lack the necessary experience and expertise, thereby increasing the cost for enterprises to outsource the services. CSPs can address enterprises' several other challenges, such as radio and technical expertise and the high cost of deployment.

Chunghwa Telecom can support enterprises with its private 5G network deployments by providing a complete suite of solutions, from advisory to on-site investigation to the design-build and maintenance of the network, thus addressing enterprise needs. Chunghwa Telecom provides its enterprise customers with proof-of-concept/proof-of-business services that allow them to test their applications and use cases with a private 5G network before the actual deployment, thus helping them validate and justify their investments in deploying a private 5G network.

### ***Customer Ownership Experience***

Enterprises seek partners that can cater to all aspects of private 5G network deployments, including building, operating, and managing the network. In addition, providers should be able to offer 5G-enabled services and applications specific to each enterprise's environment.

Chunghwa Telecom's collaboration with manufacturers to develop 5G applications will drive private 5G network deployments in the country from 2020 onwards. In 2020, Chunghwa Telecom partnered with ASE and Qualcomm to launch the first smart factory powered by a private 5G millimeter wave (mmWave) network, which can enable use cases, such as automated-guided vehicles, remote augmented reality assistance, and virtual reality experience. Chunghwa Telecom's private 5G mmWave network, developed collaboratively with Qualcomm, provides ASE with the ability to address

connectivity needs and improve business operations and experience. Chunghwa Telecom is the industry-first to launch a private 5G network with mmWave technology, setting it apart from its competitors.

### **Brand Equity**

Chunghwa Telecom is the largest CSP in Taiwan and a highly trustworthy brand that provides integrated telecommunication services. The company is widely recognized in both local and international markets and is noted for its ability to address different enterprise needs, from communication to connectivity to advanced services. Chunghwa Telecom can cater to enterprise communications needs with its mobile

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and fixed-line business and cater to enterprise connectivity and digital transformation needs with its ICT business. Additionally, Chunghwa Telecom is a long-lasting provider of data centers and has ample cloud computing resources, setting it apart from its competitors. For instance, Chunghwa Telecom owns approximately 20 Internet data centers (IDC) in Taiwan, and this number continues to increase because of rising demand. By virtue of its expertise in operating as an integrated provider of telecommunications services, Chunghwa Telecom has a clear competitive advantage in the private networking market.

### **Conclusion**

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Advanced 5G connectivity and vertical applications are the key pillars of the ongoing digital transformation revolution taking place across different industries in Taiwan. Private wireless networks are a preferred option for enterprises to address their communication and collaboration needs that will support their next-generation digital transformation requirements and unlock greater business value. Enterprises seek partners to address the early challenges in building, operating, and maintaining the private 5G network.

As an integrated solution provider, Chunghwa Telecom delivers expanded value to its customers by catering to enterprise needs, from on-site investigations to the design-build and maintenance of the network. Furthermore, Chunghwa Telecom’s R&D; strategic partnerships with global participants; and ability to leverage technologies, such as MEC, will drive the private 5G network market in Taiwan. From 2020 onwards, Chunghwa Telecom will facilitate enterprises in Taiwan to deploy private 5G networks effortlessly and affordably.

With its strong overall performance, Chunghwa Telecom earns Frost & Sullivan’s 2021 Taiwan Customer Value Leadership Award in the private 5G network industry.

## What You Need to Know about the Customer Value Leadership Recognition

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Frost & Sullivan's Customer Value Leadership Award recognizes the company that offers products or services customers find superior for the overall price, performance, and quality.

### Best Practices Award Analysis

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

#### *Business Impact*

**Financial Performance:** Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

**Customer Acquisition:** Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

**Operational Efficiency:** Company staff performs assigned tasks productively, quickly, and to a high-quality standard

**Growth Potential:** Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

**Human Capital:** Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

#### *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™.

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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 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)

