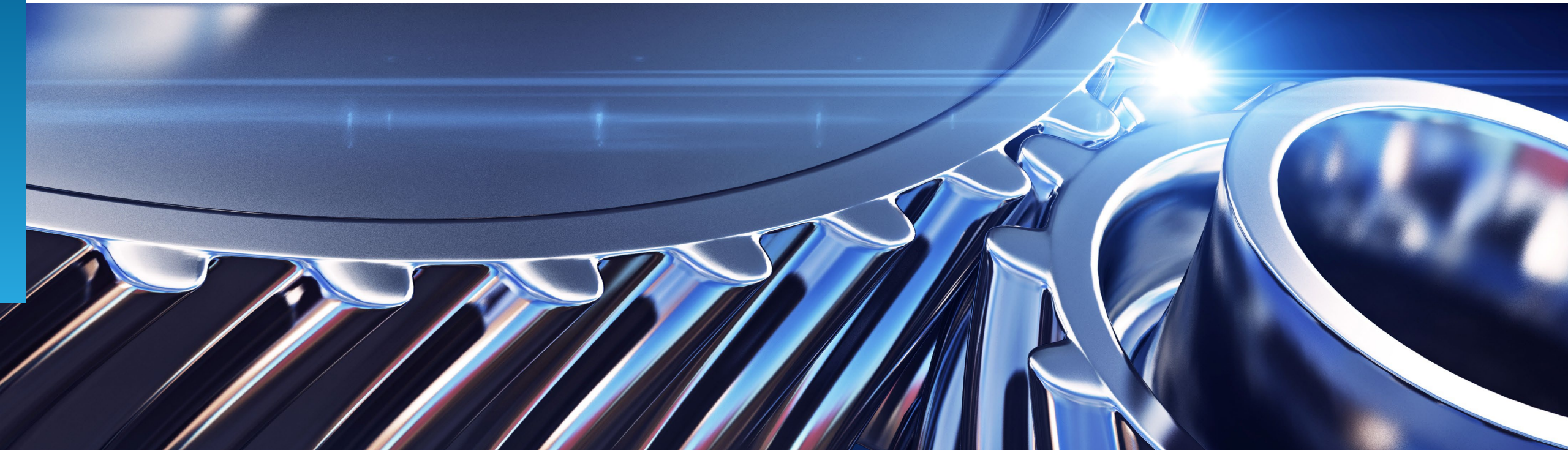


5G Engineering Services – Provider Compendium 2023

August 2023: Complimentary Abstract / Table of Contents



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- ▶ Recruitment
- ▶ Retail and CPG Information Technology
- ▶ Retirement Technologies
- ▶ Revenue Cycle Management
- ▶ Rewards and Recognition
- ▶ SAP Services
- ▶ Service Optimization Technologies
- ▶ Software Product Engineering Services
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Introduction

5G's lower latency and higher bandwidth has unlocked newer use cases for enterprises to explore. Additionally, adoption of 5G is allowing transformation of network infrastructure to make them quickly scalable, leading to higher levels of customization and lower operating costs. Enterprises are primarily exploring the below areas within 5G engineering:

- Decoupling of hardware and software in the form of network function virtualization and automation of network operations to lower the costs of network hardware, accelerate network deployment, and enhance efficiency in establishing networks
- Adoption of open-source components (hardware and software) and benchmarking their performance and operational challenges against proprietary solutions
- Feasibility of 5G-enabled use cases to boost monetization opportunities
- 5G-enabled private networks and edge computing solutions to improve industrial processes through connected IoT devices, improved data security protocols, reduced operational expenses, and faster decision-making

However, the nascent nature of the market is leading to uncertainty and increased complexity for enterprises. As a result, they are looking to partner with service providers to share development risks, lower operational costs, implement system integration measures, bring in a larger talent pool, and leverage the diverse expertise of their partner ecosystem to engineer solutions faster. To address these expectations, service providers are investing in enhancing their 5G engineering capabilities through skillset development programs, CoEs, labs to carry out R&D and showcase their solutions, partnerships with ecosystem players, and strategic investments to gain competencies and expand across geographies.

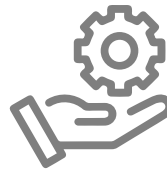
This report includes the detailed profiles of the following 20 leading engineering service providers featured on the 5G Engineering Services PEAK Matrix:

- **Leaders:** Accenture, Capgemini, HCLTech, Infosys, NTT DATA, TCS, and Tech Mahindra
- **Major Contenders:** Brillio, Cyient, DXC Luxoft, HARMAN DTS, IBM, LTTS, Tata Elxsi, Tietoevry, VVDN Technologies, and Wipro
- **Aspirants:** BICS, GS Lab I GAVS, and Sasken

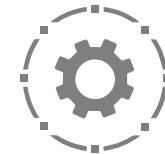
Scope of this report



Geography
Global



Providers
20 leading broad-based and pureplay service providers



Services
5G engineering services

Defining 5G engineering services

5G engineering services cover all activities involved in development and deployment of commercial and private 5G networks as well as the implementation of 5G-enabled use cases

NOT EXHAUSTIVE

5G engineering services can be categorized into three broad subsegments:



5G equipment engineering services



5G network engineering services

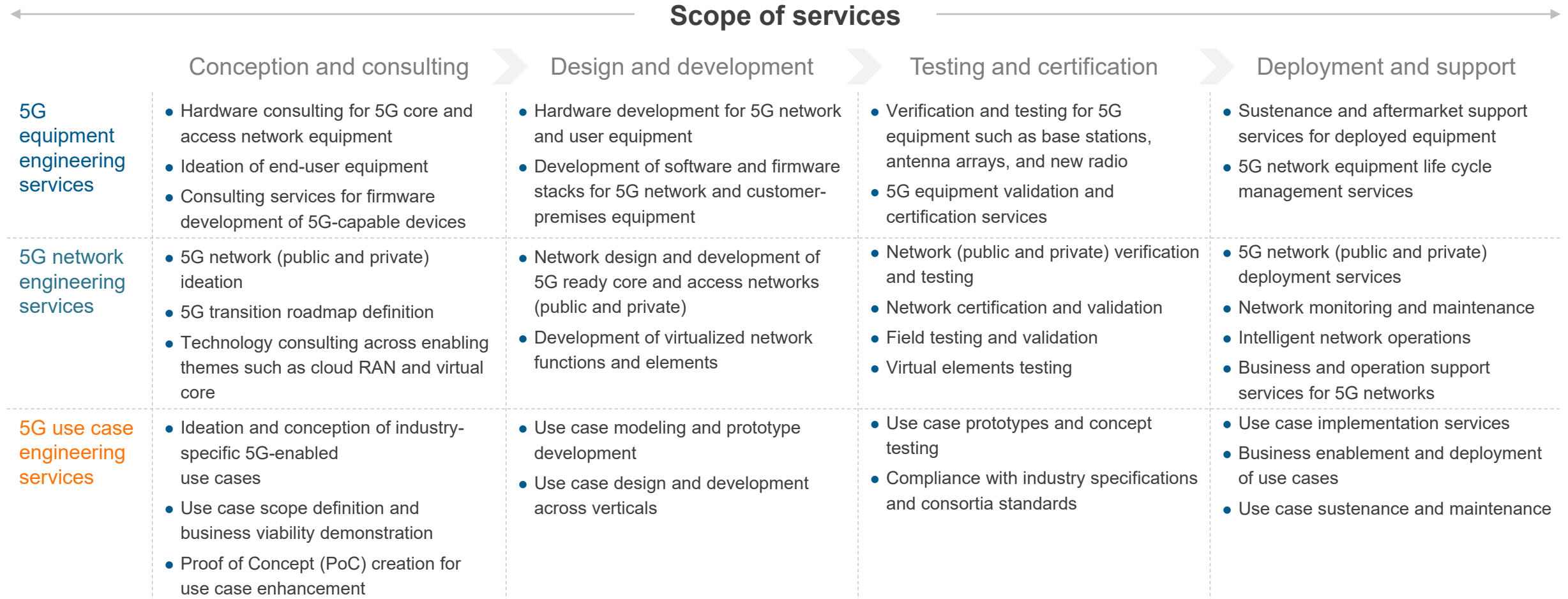


5G use case engineering services

Definition	5G equipment engineering services	5G network engineering services	5G use case engineering services
Definition	Ideation, development, testing, and support of 5G-capable devices and systems including core network, access network, and end-user equipment	Design, development, testing, certification, deployment, network assurance, network orchestration, and maintenance of commercial and private 5G networks	Conception, development, validation, and implementation services for enablement and enhancement of use cases
Target industry participants	<ul style="list-style-type: none"> Core network equipment providers (Qualcomm, Samsung, Cisco, etc.) Access network equipment providers (Ericsson, Huawei, Nokia, etc.) End-user equipment providers (Apple, Samsung, Xiaomi, etc.) Customer-premises equipment providers (Netgear, Huawei, HTC etc.) 	<ul style="list-style-type: none"> Telecommunication Service Providers (TSPs) (Verizon, DT, SK telecom, China Mobile etc.) Support systems and services providers (HPE, Dell, Cisco, Amdocs, Oracle, etc.) Enterprises opting for private 5G network deployments (Toyota, Daimler, John Deere, etc.) 	<ul style="list-style-type: none"> TSPs and equipment providers creating packaged use case-enablement offerings (AT&T, Verizon, Huawei, KT Corporation, Telia etc.) Technology providers developing offerings for implementation of use cases (Microsoft, Google Cloud, Cisco, ABB, NVIDIA, GE, AWS, etc.) Start-ups and niche players focused on 5G use case engineering (Twilio, Immersive Rehab, Valossa, Blue White Robotics, etc.)

Scope of 5G engineering services across the value-chain functions and subsegments

REPRESENTATIVE



Overview and abbreviated summary of key messages

This report examines the global 5G engineering services landscape and assesses 20 service providers. It focuses on service providers' capabilities and market impact in helping enterprises enable 5G integration through equipment engineering, network engineering, and solution engineering services. It also draws insights on the trends being followed by service providers in 5G engineering services.

Some of the findings in this report, among others, are:

Service provider position and delivery capability

- Service providers can be categorized into leaders, major contenders, and aspirants on a capability-market-share matrix for 5G engineering services
- Accenture, Capgemini, HCLTech, Infosys, NTT DATA, TCS, and Tech Mahindra are the current leaders in the global 5G engineering services market. However, several service providers are emerging as major contenders
- NTT DATA, VVDN Technologies and Wipro have emerged as the Star Performers owing to the compelling growth momentum showcased by them – both in terms of revenue and differentiated capabilities

Service provider characteristics

- The Leaders segment includes broad-based global players, which have existing capabilities to build on as well as wide client bases giving them an edge in winning client engagements. They are also investing significantly in enhancing their 5G engineering capabilities in the form of talent upskilling, labs and CoEs, building extensive partner ecosystem that would help accelerate the pace of 5G deployment and streamline operations, and explore current themes in 5G engineering such as virtualization and adoption of open-source components
- The Major Contenders segment comprises both broad-based global players and pureplay firms that have a noteworthy presence in 5G engineering services and showcase expertise in specific areas within 5G. Their distribution of revenue and client portfolio is generally inclined toward specific subsegments, ecosystem entities, or verticals with lower presence across others. Most Major Contenders are small to midsized firms with a fast-growing 5G engineering services business
- Aspirants consist of players whose 5G engineering services business is in nascent stages. They have capabilities in specific stages of the value chain and limited diversity in their client portfolio. They have a smaller employee base and limited geographical presence that hinders their chances at scaling their business rapidly. They have made limited investments in enhancing their 5G engineering capabilities and they are more focused on scaling the current offerings than having a diversified portfolio

The 5G engineering service provider compendium report has profiles and buyer case studies for 20 leading engineering service providers

5G Engineering Services – Provider Compendium 2023

Provider 1 profile (page 1 of 4) Overview

Vision and Strategy
Provider 1's vision is to connect enterprises to 5G to business to custom ensuring scaled deployments and business and technology efficiency. Provider 1 aims to achieve this by reaching a broader range of 5G customer enabled ecosystem. For network equipment and cloud service provider R&D, and 5G open systems through accelerated deployment, AI/ML, automation and virtualization. It enables large-scale business-critical connectivity through deployments and helps customers build industry solutions on 5G. Provider 1 foresees a world where private 5G networks will grow global thousands of business-critical private 5G network.

5G engineering services revenue¹ (July 2021 – June 2022)

<US\$50 million	US\$50-100 million	US\$100-200 million
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YoY growth rate in 5G engineering services revenue¹ (July 2021 – June 2022)

<25%	25-50%	50-75%
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Revenue by geography

North America	South America	Japan
UK	India	Rest of APAC
Rest of Europe	China	MEA

1 Source: Everest Group estimates

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5G Engineering Services – Provider Compendium 2023

Provider 1 profile (page 2 of 4) Case studies and solutions

Case study 1 Partnered with a global leader in network test and emulation ORAN platform

Business challenge
The client was looking for a partner to modernize its architecture and a cloud and DevOps processes for its telecom and networks testing platform a virtual test environment that could emulate ORAN components and interfaces.

Solution and impact
Provider 1 collaborated with different client R&D divisions and third-party ORAN protocol stack and a rich RAN test scenario emulator for RIC components enabled the clients to provide access to CI/CD automation and 3GPP client to transition to modern microservices architectures and open-source cost savings.

Case study 2 Helped a large oil and gas company in private network

Business challenge
The client was looking to drive operational efficiencies across field services integrated use cases to drive productivity and seamlessly melt OT and IT to achieve operational efficiencies through cost-effective solutions, productivity and cost savings.

Solution and impact
Provider 1 oversaw the entire project from site survey and RF engineering communication, and status updates to post-implementation. Provider 1 engineering firms helped the client by bringing a cost-effective solution access to actionable data and facilitated new data collection from unstructured cloud-based applications.

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Provider 1 profile (page 3 of 4) Investments and partnerships

Key alliances and partnership (representative list)

Company	Details
Company 1	A partnership to modernize architecture while utilizing cloud-native
Company 2	A partnership involving software-defined networking
Company 3	A partnership to modernize architecture
Company 4	A partnership to modernize architecture and analytics capabilities
Company 5	A partnership to modernize architecture
Company 6	A partnership for modernizing architecture
Company 7	A partnership involving Provider 1's software

Recent 5G engineering services investments/acquisitions (representative list)

Investment/target	Description
Investment 1	Investments in digital transformation
Investment 2	Investments in digital transformation
Investment 3	Investments in digital transformation

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5G Engineering Services – Provider Compendium 2023

Provider 1 profile (page 4 of 4) Everest Group assessment – Major Contender

Measure of capability: ● Low ● High

Market impact				Vision & capability				
Market adoption	Portfolio mix	Value delivered	Overall	Vision and strategy	Scope of services offered	Innovation and investments	Delivery footprint	Overall
●	●	●	●	●	●	●	●	●

Strengths

- Provider 1's focus on deploying E2E private 5G networks and 5G-enabled use cases has helped them diversify their portfolio across telecom, automotive, oil and gas, and ISV
- It has a balanced portfolio of clients, spread across small, midsize, and large enterprises in terms of revenue
- Customers have appreciated Provider 1's domain understanding and willingness to further enhance its technical expertise
- Clients have also recognized Provider 1 to be cost competitive and flexible to adapt to client requirements. They also highlighted that Provider 1 is able to understand and replicate customer vision in joint GTM approaches

Limitations

- The majority of Provider 1's engagements are through traditional pricing models, such as time and material or fixed-price model, and they have limited to no exposure to pricing models such as revenue-sharing or outcome-based model
- Provider 1 is focused on the North America and European markets and is yet to explore emerging markets such as APAC
- It is engaging primarily through delivery centers in Eastern Europe, Germany, and the US. Nearshore locations, such as LATAM, or offshore locations, such as India, are yet to be explored
- Customers highlighted that Provider 1 would need to streamline communication across program management teams

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Research calendar

Engineering Research and Development

Published Planned Current release

Reports title	Release date
Unleashing the Era of Phygital Manufacturing – Industry 4.0 State of the Market 2023	February 2023
Engineering R&D (ER&D) Outlook for 2023	February 2023
Engineering Services CXO Insights: Key Issues Report 2023	April 2023
5G Engineering Services PEAK Matrix® Assessment 2023: The Next Frontier in the Hyperconnected Era	June 2023
5G Engineering Services – Provider Compendium 2023	August 2023
Engineering Services Top 50 2023	Q3 2023
Engineering Services Provider of the Year 2023	Q3 2023
ACES Mobility Automotive Engineering Services PEAK Matrix® Assessment 2023	Q3 2023
ACES Mobility Engineering Services – Provider Compendium 2023	Q3 2023
ACES Automotive Engineering Services State of the Market 2023	Q3 2023
Trends in the Top 200 Engineering Research & Development (ER&D) Enterprises 2023	Q3 2023
Digital Product Engineering Services PEAK Matrix® Assessment 2023	Q4 2023
Digital Product Engineering Services Provider Compendium 2023	Q4 2023
Digital Product Engineering Services State of the Market Report 2023	Q4 2023

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