

# Interlude to Triumph: 5G Engineering Services State of the Market

February 2024: Complimentary Abstract / Table of Contents



# Our research offerings

This report is included in the following research program(s):

## Engineering Research and Development

- ▶ Amazon Web Services (AWS)
- ▶ Application Services
- ▶ Artificial Intelligence (AI)
- ▶ Asset and Wealth Management
- ▶ Banking and Financial Services Business Process
- ▶ Banking and Financial Services Information Technology
- ▶ Catalyst™
- ▶ Clinical Development Technology
- ▶ Cloud and Infrastructure
- ▶ Contingent Staffing
- ▶ Contingent Workforce Management
- ▶ Customer Experience Management Services
- ▶ CX Excellence
- ▶ CXM Technology
- ▶ Cybersecurity
- ▶ Data and Analytics
- ▶ Digital Adoption Platforms
- ▶ Digital Services
- ▶ Digital Workplace
- ▶ Employee Experience Management (EXM) Platforms
- ▶ Employer of Record (EOR)
- ▶ Engineering Research and Development
- ▶ Enterprise Platform Services
- ▶ Exponential Technologies
- ▶ Finance and Accounting
- ▶ Financial Services Technology (FinTech)
- ▶ Forces & Foresight
- ▶ GBS Talent Excellence
- ▶ Global Business Services
- ▶ Google Cloud
- ▶ HealthTech
- ▶ Human Resources
- ▶ Insurance Business Process
- ▶ Insurance Information Technology
- ▶ Insurance Technology (InsurTech)
- ▶ Insurance Third-Party Administration (TPA) Services
- ▶ Intelligent Document Processing
- ▶ Interactive Experience (IX) Services
- ▶ IT Services Excellence
- ▶ IT Talent Excellence
- ▶ Life Sciences Business Process
- ▶ Life Sciences Commercial Technologies
- ▶ Life Sciences Information Technology
- ▶ Locations Insider™
- ▶ Marketing Services
- ▶ Market Vista™
- ▶ Microsoft Azure
- ▶ Microsoft Business Application Services
- ▶ Modern Application Development (MAD)
- ▶ Mortgage Operations
- ▶ Multi-country Payroll
- ▶ Network Services and 5G
- ▶ Oracle Services
- ▶ Outsourcing Excellence
- ▶ Payer and Provider Business Process
- ▶ Payer and Provider Information Technology
- ▶ Price Genius – AMS Solution and Pricing Tool
- ▶ Pricing Analytics as-a-Service
- ▶ Process Intelligence
- ▶ Process Orchestration
- ▶ Procurement and Supply Chain
- ▶ Recruitment
- ▶ Retail and CPG IT Services
- ▶ Retirement Technologies
- ▶ Revenue Cycle Management
- ▶ Rewards and Recognition
- ▶ SAP Services
- ▶ Service Optimization Technologies
- ▶ Software Product Engineering Services
- ▶ Supply Chain Management (SCM) Services
- ▶ Sustainability Technology and Services
- ▶ Talent Genius™
- ▶ Technology Skills and Talent
- ▶ Trust and Safety
- ▶ Value and Quality Assurance (VQA)

If you want to learn whether your organization has a membership agreement or request information on pricing and membership options, please contact us at [info@everestgrp.com](mailto:info@everestgrp.com)

Learn more about our  
**custom research capabilities**

Benchmarking

Contract assessment

Peer analysis

Market intelligence

Tracking: providers, locations,  
risk, technologies

Locations: costs, skills,  
sustainability, portfolios

# Contents

<b>1. Introduction and overview</b>	<b>5</b>
• Research methodology	6
• Background and introduction	7
• Scope of 5G engineering services	8
• How to read this document	10
• Summary of key messages	11
<b>2. Market overview</b>	<b>12</b>
• 5G ER&D market overview	13
• Spending across segments and geographies	14
<b>3. 5G engineering trends</b>	<b>16</b>
• Focus on network expansion and modernization	18
• Adoption of private 5G networks	22
• Snapshot of emerging technologies in 5G	25
– 5G-NTN	26
– Open Gateway	27
– RedCap	28
– Network slicing	29
– Open RAN	30
– 5G and AI	31
• Challenges in commercial rollouts	32

For more information on this and other research published by Everest Group, please contact us:

**Nishant Udupa**, Practice Director

**Agnivesh Tripathy**, Senior Analyst

# Contents

<b>4. Outsourcing landscape</b>	<b>33</b>
• 5G engineering sourcing priorities	34
• 5G engineering services market size	35
• Key outsourcing themes across segments	36
• Market distribution	37
• Private 5G engineering services	38
• Customer feedback on 5G engineering services	39
• Investments by service providers	40
<b>5. Appendix</b>	<b>42</b>
• Glossary	43
• Research calendar	44

## Introduction

Investments in 5G engineering, driven by 5G's high reliability, low latency, high bandwidth, easy customizability, and strong support for a plethora of use cases across verticals, had been growing at lightning speed over the last few years. 5G saw Telecommunication Service Providers (TSPs) and Telecommunication Equipment Providers (TEPs) pouring in capital to rapidly expand 5G networks across the globe and ideate new offerings to attract customers, while enterprises too actively explored how 5G could transform their businesses.

However, things have been different since the latter half of 2022. While TSPs rushed into expanding their 5G networks, consumer migration to 5G has been slow. Enterprises, while actively exploring the potential of 5G, still contemplate adopting it as a scaled initiative, due to the high capital costs and limited number of credible success stories. All this, combined with fewer monetization opportunities and recessionary macroeconomic environments, makes TSPs and TEPs ponder on how to generate returns on the huge investments made into the equipment, network infrastructure, and use case development.

Despite this uncertain environment, several 5G subthemes have been resilient and are attracting investments from ecosystem entities. In this report, we assess the 5G engineering market, identify the key trends shaping up R&D in the space, and study the challenges and opportunities that lie ahead for 5G. The report also narrates how well providers are aligned with the 5G engineering requirements of their customers, and how providers are enhancing their capabilities to become partners of choice.

### Scope of this report



**Geography**  
Global



**Services**  
5G engineering services

## Overview and abbreviated summary of key messages

In this report, we assess the 5G engineering market, identify the key trends shaping up R&D in the space, and study the challenges and opportunities that lie ahead for 5G. The report also narrates how well providers are aligned with the 5G engineering requirements of their customers, and how providers are enhancing their capabilities to become partners of choice.

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

### Market overview

- 5G ER&D grew at a relatively slower pace in 2022 and marginally declined (1-3%) to reach US\$12.7-12.9 billion
- The slowdown was driven by the current macroeconomic conditions and the lower-than anticipated adoption of 5G
- With network expansion and modernization being the key focus areas, equipment and network engineering form the major portion of 5G ER&D, driven by the rapid rollout across new markets, the need for high-scale testing and validation, usage of renewable components in equipment, and introduction of network capabilities such as network slices and Open Gateway

### 5G engineering trends

- In order to improve operations and grow the user base, TSPs and TEPs are modernizing and expanding the 5G networks by rolling out stand-alone 5G, densifying networks, and adopting telco clouds and sustainability measures
- The adoption of private 5G networks has been slower than anticipated, due to the nascency of technology, high switching costs, and very few high-impact applications. However, use cases that require a wide area coverage and very low latency saw significant adoption of private 5G
- Amid the conservative sentiments, stakeholders are investing in areas with future potential, including the commercialization of network slices, applications of networks APIs, trials of 5G non-terrestrial networks, introduction of RedCap devices, and the adoption of AI in operations

### Outsourcing landscape

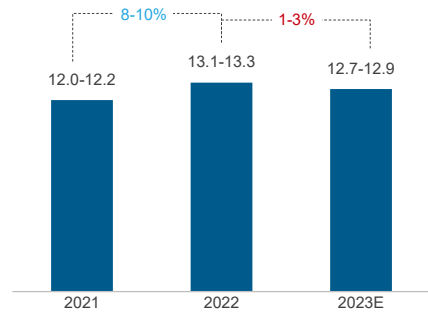
- 5G engineering services have been growing at a slower pace (6-8%, 2023E) to reach US\$2.8-3 billion in 2023
- Close to 75% of all outsourcing is observed across network and equipment engineering, driven by the fact that TSPs and TEPs are focused on 5G expansion
- Service providers are actively investing in enhancing their 5G engineering capabilities by setting up labs and innovation centers to ideate and co-create solutions with customers, building proprietary solutions and frameworks, forging strategic partnerships with ecosystem players, and building a talent pool through in-house curriculum, certifications, and hands-on training

# This study offers three distinct chapters providing a deep dive into key aspects of 5G engineering market; below are four charts to illustrate the depth of the report

## Enterprise spending on 5G ER&D

Overall 5G ER&D spending  
2021-23E; US\$ billion

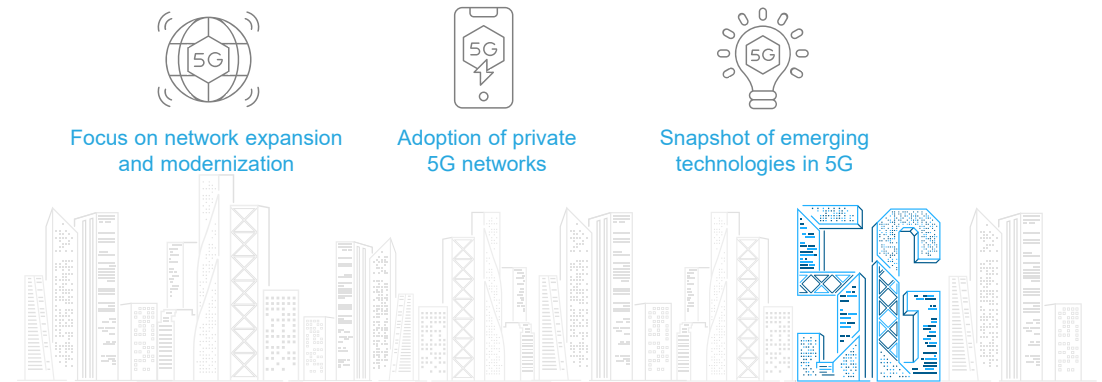
X% YoY growth  
X% YoY decline



### 5G ER&D market

- Until 2021, 5G ER&D was one of the fastest growing ER&D segments
- ER&D spending in this space has slowed down since 2022, due to the cut down in discretionary spending and the technology still facing viability issues such as complex network operations and high capital investments
- On the enterprise front as well, firms are critical about committing resources for private 5G networks, considering the high capital investments, the switching costs, and the nascency of the technology
- While TSPs rushed in the network rollouts, consumer adoption has been more gradual due to the low incremental value realization for users

## Themes of investments



## Emerging technologies in 5G

Snapshot of emerging technologies in 5G



### Ideation and PoC

### 5G-NTN

It is still in the ideation and research stage, with very few PoC demonstrations. More PoCs and trials are expected in 2024.

### Open Gateway

TSPs have launched platforms giving developers access to APIs. However, use cases are yet to gain proeminence.



### Early trials and commercial releases

### RedCap

There are a number of trials going on across TEPs and TSPs, with select solutions being introduced in the market.

### Network slicing

With the increase in stand-alone 5G networks and the gradual redressal of roadblocks, TSPs have started rolling out network slices commercially.



### Large-scale commercialization

### Open RAN

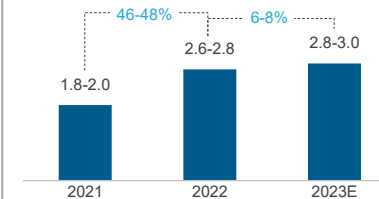
Macroeconomic conditions and persistent challenges have slowed down the adoption of Open RAN.

### 5G and AI

AI is being extensively used across the 5G value chain, primarily in testing and intelligent network operations. The combined capabilities of 5G and AI are being leveraged to deploy industrial use cases.

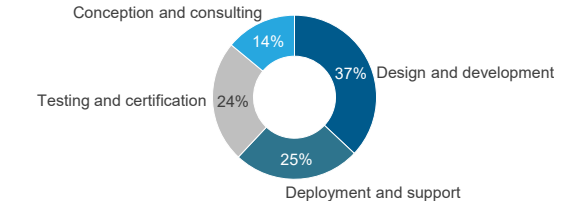
## Outsourcing landscape

5G engineering outsourcing spending trend  
FY2021-23E; US\$ billion



5G engineering services revenues – by value chain  
2023E; percentage

100% = US\$3.0-3.2 billion



- Services had grown at a fast pace historically, driven by the need for a larger talent pool, constantly evolving technologies, and the need for scaling capabilities and lowering costs. However, since the latter half of 2022, the segment has experienced a slowdown in growth owing to the cut down in discretionary spending globally and fewer the lower-than-anticipated adoption of 5G networks. The slowdown continued to impact the services business in 2023 as well
- As enterprises are still focused on 5G network expansion, outsourcing is at the highest in the design and development and testing and certification stages, especially within network and equipment engineering services

# Research calendar

## Engineering Research and Development

■ Published
 ■ Planned
 ■ Current release

Reports title	Release date
5G Engineering Services – Provider Compendium 2023	July 2023
ACES Automotive Engineering Services PEAK Matrix® Assessment 2023: Navigating the Future of Automotive Landscape	September 2023
Engineering Services Top 50 2023	September 2023
Aerospace and Defense State of the Market 2023	October 2023
ACES Mobility Engineering Services – Provider Compendium 2023	October 2023
Leading the Pack: Trends for the Top 200 Engineering Research & Development (ER&D) Enterprises 2023	December 2023
The Silicon Shakedown – Unpacking the Impact of Technology and Geopolitics on Semiconductor Engineering	December 2023
Engineering R&D (ER&D) Outlook for 2024	January 2024
<b>Interlude to Triumph: 5G Engineering Services State of the Market</b>	<b>February 2024</b>
ACES Automotive Engineering Services State of the Market 2024	Q1 2024
Connected Product Engineering Services PEAK Matrix® Assessment 2024	Q1 2024
Connected Product Engineering Service Provider Compendium 2024	Q1 2024
Enterprise Pulse Report	Q2 2024
Connected Product Engineering Services State of the Market 2024	Q2 2024
Semiconductor Engineering Services PEAK Matrix® Assessment 2024	Q3 2024

Note: [Click](#) to see a list of all of our published Engineering Research and Development reports





Everest Group is a leading research firm helping business leaders make confident decisions. We guide clients through today's market challenges and strengthen their strategies by applying contextualized problem-solving to their unique situations. This drives maximized operational and financial performance and transformative experiences. Our deep expertise and tenacious research focused on technology, business processes, and engineering through the lenses of talent, sustainability, and sourcing delivers precise and action-oriented guidance. Find further details and in-depth content at [www.everestgrp.com](http://www.everestgrp.com).

## Stay connected

**Dallas (Headquarters)**  
info@everestgrp.com  
+1-214-451-3000

**Bangalore**  
india@everestgrp.com  
+91-80-61463500

**Delhi**  
india@everestgrp.com  
+91-124-496-1000

**London**  
unitedkingdom@everestgrp.com  
+44-207-129-1318

**Toronto**  
canada@everestgrp.com  
+1-214-451-3000

**Website**  
[everestgrp.com](http://everestgrp.com)

**Social Media**  
 @EverestGroup  
 @Everest Group  
 @Everest Group  
 @Everest Group

**Blog**  
[everestgrp.com/blog](http://everestgrp.com/blog)

## NOTICE AND DISCLAIMERS

**IMPORTANT INFORMATION. PLEASE REVIEW THIS NOTICE CAREFULLY AND IN ITS ENTIRETY. THROUGH YOUR ACCESS, YOU AGREE TO EVEREST GROUP'S TERMS OF USE.**

Everest Group's Terms of Use, available at [www.everestgrp.com/terms-of-use/](http://www.everestgrp.com/terms-of-use/), is hereby incorporated by reference as if fully reproduced herein. Parts of these terms are pasted below for convenience; please refer to the link above for the full version of the Terms of Use.

Everest Group is not registered as an investment adviser or research analyst with the U.S. Securities and Exchange Commission, the Financial Industry Regulatory Authority (FINRA), or any state or foreign securities regulatory authority. For the avoidance of doubt, Everest Group is not providing any advice concerning securities as defined by the law or any regulatory entity or an analysis of equity securities as defined by the law or any regulatory entity.

All Everest Group Products and/or Services are for informational purposes only and are provided "as is" without any warranty of any kind. You understand and expressly agree that you assume the entire risk as to your use and any reliance upon any Product or Service. Everest Group is not a legal, tax, financial, or investment advisor, and nothing provided by Everest Group is legal, tax, financial, or investment advice. Nothing Everest Group provides is an offer to sell or a solicitation of an offer to purchase any securities or instruments from any entity. Nothing from Everest Group may be used or relied upon in evaluating the merits of any investment. Do not base any investment decisions, in whole or part, on anything provided by Everest Group.

Products and/or Services represent research opinions or viewpoints, not representations or statements of fact. Accessing, using, or receiving a grant of access to an Everest Group Product and/or Service does not constitute any recommendation by Everest Group that recipient (1) take any action or refrain from taking any action or (2) enter into a particular transaction. Nothing from Everest Group will be relied upon or interpreted as a promise or representation as to past, present, or future performance of a business or a market. The information contained in any Everest Group Product and/or Service is as of the date prepared, and Everest Group has no duty or obligation to update or revise the information or documentation. Everest Group may have obtained information that appears in its Products and/or Services from the parties mentioned therein, public sources, or third-party sources, including information related to financials, estimates, and/or forecasts. Everest Group has not audited such information and assumes no responsibility for independently verifying such information as Everest Group has relied on such information being complete and accurate in all respects. Note, companies mentioned in Products and/or Services may be customers of Everest Group or have interacted with Everest Group in some other way, including, without limitation, participating in Everest Group research activities.