Envisioning the Connected Future – 5G Engineering Services State of the Market Report 2022
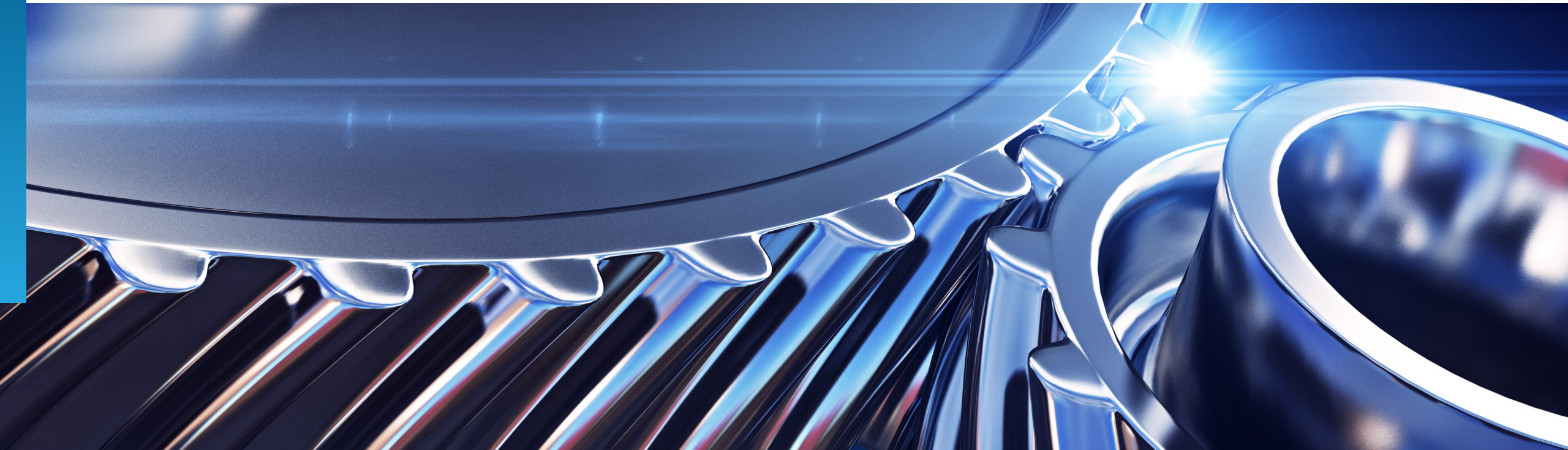
March 2022: Complimentary Abstract / Table of Contents

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Background and introduction to this research

5G, the latest in mobile network technology, offers high data transfer speeds and ultra-low latency. Through these, it enables use cases across industry segments. Hence, service providers are developing 5G capabilities in industries outside of network development and maintenance and across the value chain right from consulting and design services to post-deployment support.

Enterprises and service providers are gearing up to accommodate the changes that 5G is likely to bring in the near future. This is shaping up trends that will impact the 5G engineering services industry in the coming years. A number of assistive technologies such as cloud, network slicing, Software-defined Networking (SDN), and Multi-access Edge Computing (MEC) are helping service providers in bringing the best of 5G to enterprises.

As 5G is a new space, new applications are conceived on an ongoing basis. This opens up a new dimension of 5G engineering services where service providers are helping enterprises and telcos with conceptualization and scaling of various use cases across industries. Service providers also have dedicated offerings for technology vendors/start-ups that focus on solution engineering within the 5G space.

This report assesses the global 5G engineering services market and the trends that are emerging as a result of the increasing number of use cases. The scope of the analysis in this report includes an understanding of enterprise expectations, challenges for service providers, the market for 5G engineering services outsourcing, and the investments being made by enterprises and service providers.
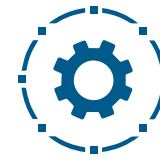
Scope of this report

Geography
Global

Industry
Telecommunications

Services
5G engineering services such as conception and consulting, design and development, testing and certification, and deployment and support services
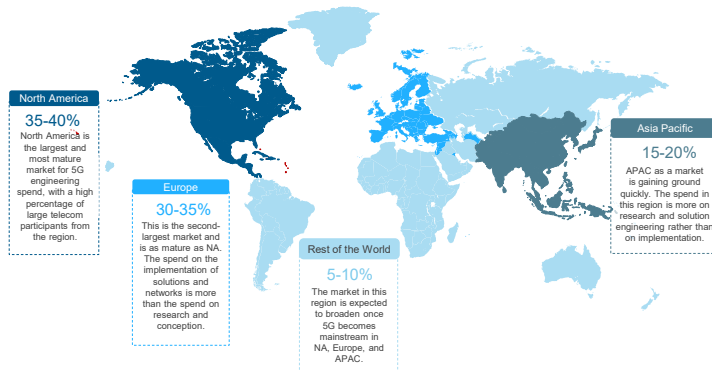
Use cases
5G use cases from automotive, industrial products, energy and utilities, and media and entertainment industries

Summary of key messages

Market overview

- The 5G market has evolved rapidly over the last decade and currently represents the fastest growing market segment within global ER&D

- The overall enterprise spend for 5G engineering services has been increasing; however, COVID-19 caused a slight dip in numbers during CY 2020

- Large Communication Service Providers (CSPs) and Network Equipment Providers (NEPs) from North America and EU are driving the major chunk of spend in 5G engineering

- The major roadblocks to adoption include high setup costs, complex use cases, and the regulatory landscape around 5G

Major trends impacting the 5G market

- Service providers need to develop capabilities in assistive technologies, such as Multi-access Edge Compute (MEC), Software-defined Networking (SDN), and cloud, which are enabling the world of 5G

- The private network market for 5G is growing fast; and given the benefits that it offers as compared with previous generations, enterprise adoption and the related engineering will also observe strong growth momentum

- A variety of 5G-driven use cases have led to collaboration between an ecosystem of network participants for developing solutions and providing services to an ever-growing market
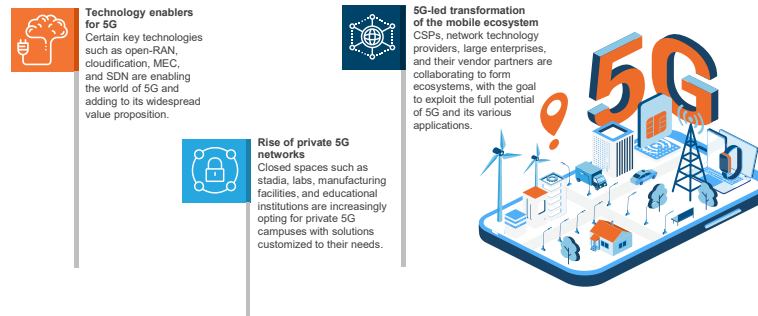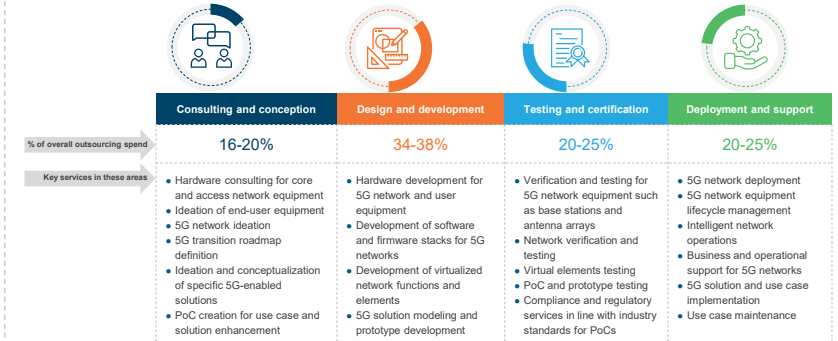
Outsourcing landscape

- Outsourcing spend has slightly reduced in CY 2020 owing to the reallocation of resources due to COVID-19

- Network engineering services acquire the largest chunk of the market and are the fastest-growing subsegment

- The growth rate of 5G engineering services revenue has been proportionate to the size of players in this segment, with larger service providers addressing a major chunk of the market

- Service providers are investing heavily in developing strong partnerships, infrastructure, talent, and IPs to cater to the 5G market
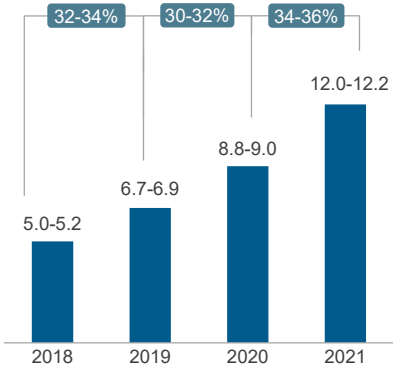
5G engineering spend split by geography

North America
35-40%
North America is the largest and most mature market for 5G engineering spend, with a high percentage of large telecom participants from the region.

Europe
30-35%
This is the second-largest market and is as mature as NA. The spend on the implementation of solutions and networks is more than the spend on research and conception.

Rest of the World
5-10%
The market in this region is expected to broaden once 5G becomes mainstream in NA, Europe, and APAC.

Asia Pacific
15-20%
APAC as a market is gaining ground quickly. The spend in this region is more on research and solution engineering rather than on implementation.

Major trends impacting the 5G market

Technology enablers for 5G
Certain key technologies such as open-RAN, cloudification, MEC, and SDN are enabling the world of 5G and adding to its widespread value proposition.

Rise of private 5G networks
Closed spaces such as stadia, labs, manufacturing facilities, and educational institutions are increasingly opting for private 5G campuses with solutions customized to their needs.

5G-led transformation of the mobile ecosystem
CSPs, network technology providers, large enterprises, and their vendor partners are collaborating to form ecosystems, with the goal to exploit the full potential of 5G and its various applications.

Outsourced spend areas for 5G engineering services

	Consulting and conception	Design and development	Testing and certification	Deployment and support
% of overall outsourcing spend	16-20%	34-38%	20-25%	20-25%
Key services in these areas	• Hardware consulting for core and access network equipment • Ideation of end-user equipment • 5G network ideation • 5G transition roadmap definition • Ideation and conceptualization of specific 5G-enabled solutions • PoC creation for use case and solution enhancement	• Hardware development for 5G network and user equipment • Development of software and firmware stacks for 5G networks • Development of virtualized network functions and elements • 5G solution modeling and prototype development	• Verification and testing for 5G network equipment such as base stations and antenna arrays • Network verification and testing • Virtual elements testing • PoC and prototype testing • Compliance and regulatory services in line with industry standards for PoCs	• 5G network deployment • 5G network equipment lifecycle management • Intelligent network operations • Business and operational support for 5G networks • 5G solution and use case implementation • Use case maintenance

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

Global enterprise spend for the 5G engineering market
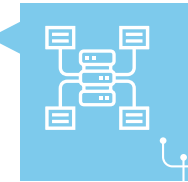
Overall 5G engineering spending
2018-21; US$ billion

| X% | YoY growth |

- 5.0-5.2 (2018)
- 6.7-6.9 (2019)
- 8.8-9.0 (2020)
- 12.0-12.2 (2021)

32-34% · 30-32% · 34-36%

5G ER&D market

- Enterprise ER&D in 5G is a nascent and fast-growing market that is expected to show ~30% growth rate for the next four to five years
- The impact of COVID-19 was limited to a slight decrease in the growth rate for enterprise spend. Given that this market is still opening up, it is expected to bounce back to pre-COVID-19 levels by 2023
- 5G engineering is experiencing increasing demand from almost all industry segments. To respond to this, many submarkets have evolved and are providing industry-specific vertically integrated solutions, especially in the manufacturing, automotive, consumer electronics, and utility sectors
- The current enterprise spend is the highest on ideation and design and the least on post-deployment support. However, this mix of spend across the value chain is expected to change as 5G slowly becomes more mainstream. Post-deployment support will begin to gain prominence as ideation and design will slowly pull back, while the reverse will be true for new and emerging markets

Key technology enablers for 5G

Open-source technology is used for network disaggregation where there is no requirement for proprietary hardware and software. This will ensure better customization and greater value for enterprises.

MEC shifts the computing traffic from a centralized cloud to the edge of the network and closer to end device. This frees up the cloud's computational capacities and ensures minimum time lag.

Cloudification is the enabling of 5G-powered services and business models by leveraging emerging network technologies such as SDN, NFV, and MEC to add value to the 5G world and letting enterprises scale their offerings.
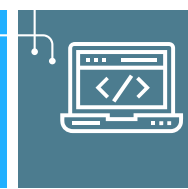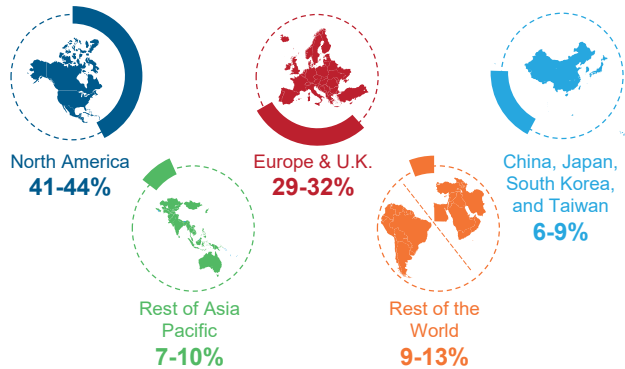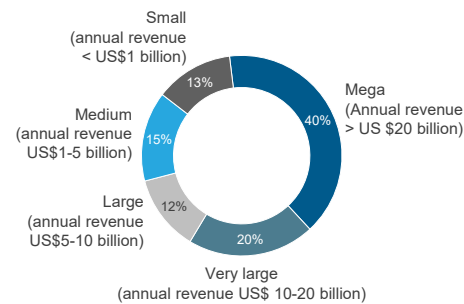
Software-defined Networking (SDN) and Network Function Virtualization (NFV) utilize network equipment as software stacks. This allows for programmable elements, thereby increasing the functionality of network elements.

Outsourcing landscape

5G engineering services revenues – by geographies
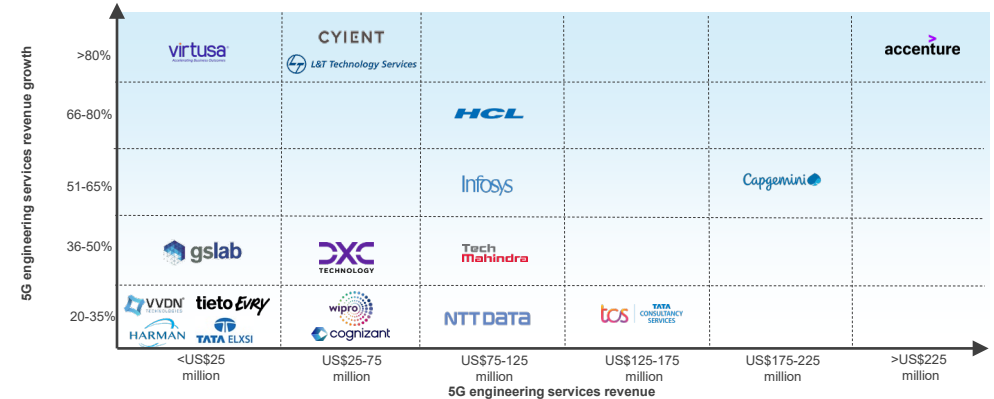2021; 100% US$2.7-2.9 billion

- North America **41-44%**
- Europe & U.K. **29-32%**
- China, Japan, South Korea, and Taiwan **6-9%**
- Rest of Asia Pacific **7-10%**
- Rest of the World **9-13%**

5G engineering services revenues – by buyer segment
2021; 100% US$2.7-2.9 billion

- Small (annual revenue < US$1 billion): 13%
- Medium (annual revenue US$1-5 billion): 15%
- Large (annual revenue US$5-10 billion): 12%
- Very large (annual revenue US$ 10-20 billion): 20%
- Mega (Annual revenue > US $20 billion): 40%

Growth and revenue share across top service providers

5G engineering services – service provider revenue and growth rate

5G engineering services revenue growth (vertical axis): 20-35%, 36-50%, 51-65%, 66-80%, >80%

5G engineering services revenue (horizontal axis): <US$25 million, US$25-75 million, US$75-125 million, US$125-175 million, US$175-225 million, >US$225 million

	<US$25 million	US$25-75 million	US$75-125 million	US$125-175 million	US$175-225 million	>US$225 million
>80%	virtusa	CYIENT / L&T Technology Services				accenture
66-80%			HCL			
51-65%			Infosys		Capgemini	
36-50%	gslab	DXC TECHNOLOGY	Tech Mahindra			
20-35%	VVDN / tieto EVRY / HARMAN / TATA ELXSI	wipro / cognizant	NTT DATA	tcs TATA CONSULTANCY SERVICES		

Research calendar
Engineering services

Flagship reports	Release date
Envisioning the Connected Future: 5G Engineering Services PEAK Matrix® Assessment 2021	September 2021
Digital Product Engineering Services PEAK Matrix® Assessment 2022	March 2022
Envisioning the Connected Future – 5G Engineering Services State of the Market Report 2022	**March 2022**
Digital Product Engineering State of the Market Report 2022	Q2 2022
Industry 4.0 Services PEAK Matrix® Assessment 2022	Q2 2022
Software Product Engineering Services PEAK Matrix® Assessment 2022	Q3 2022
Industry 4.0 State of the Market Report 2022	Q3 2022
Industrial Products Engineering Services PEAK Matrix® Assessment 2022	Q4 2022

Thematic reports	Release date
Trailblazers: Industry 4.0 Service Providers	January 2022
Engineering R&D (ER&D) in 2022: Key Macroeconomic and Technological Trends that Will Shape the ER&D Industry in 2022	February 2022
Environmental, Social, Governance (ESG) in Engineering Services 2022	March 2022
Engineering Services Top 50 report 2022	Q2 2022
Trends in the Top 200 Engineering Research & Development (ER&D) Enterprises	Q2 2022
Enterprise Pulse Report 2022	Q3 2022
Artificial Intelligence (AI) and its Applications in Product Engineering	Q3 2022

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