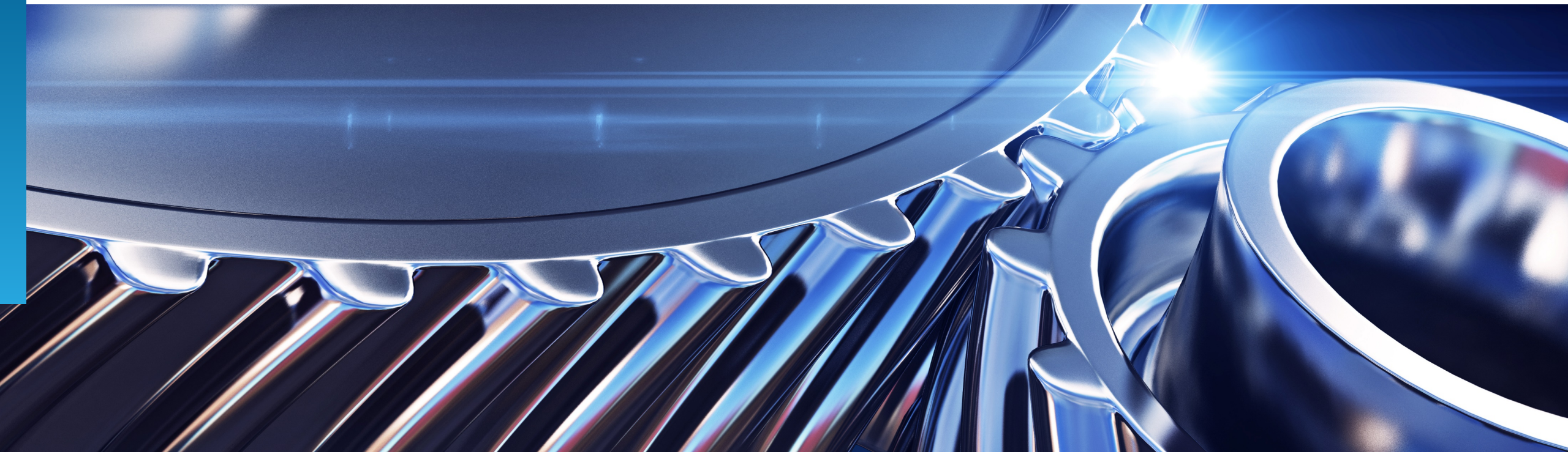
Everest Group®

State of the Market Report | Engineering Services

Enabling the Hyper-connected Intelligent World – Semiconductor Engineering State of the Market Report 2021

November 2021: Complimentary Abstract / Table of Contents



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Background and introduction of the research

Semiconductors are the basic components of all kinds of electronic devices, and have a complex manufacturing process that requires sophisticated engineering across all the stages of the value chain. The semiconductor industry is receiving significant ER&D investments, driven by factors such as the increasing adoption of AI chips, proliferation of IoT and connected devices, and the shift to 3 nanometer (3nm) technology. Semiconductor enterprises are facing challenges in catering to the evolving customer demands as well as in managing the increased complexity in the value chain due to design changes and complex validation procedures.

Service providers in the semiconductor engineering space are helping enterprises such as fabless companies, integrated device manufacturers (IDMs), and foundries across their needs for product development, fabrication, testing, and life cycle management. Semiconductor engineering service offerings span four service functions, which broadly capture the semiconductor industry value chain:

- Design & verification
- Validation & testing
- Sustenance & value engineering
- Other services related to manufacturing

Pursuant to the first edition of Everest Group's Semiconductor Engineering Services PEAK Matrix® Assessment, this report examines the dynamics of global semiconductor engineering services trends prevalent among leading service providers. The scope of this report covers the below segments including market overview, an in-depth view on semiconductor engineering services outsourcing, and the emerging trends in the market.

Scope of this report:

Market overview

Emerging trends

Outsourcing landscape

Appendix

Overview and abbreviated summary of key messages

This report presents a comprehensive analysis of the semiconductor engineering services market covering overall market size and growth, and key market trends across talent, technology, and engagement model. The report also includes a view on key strategies adopted by service providers to achieve growth in a dynamic landscape of product demand and technology.

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

Market overview

- Global semiconductor sales have recovered from the dip in 2019 to rise above 1 trillion units, and APAC now has the highest growth forecast
- Personal computers (PCs) and communications sectors lead in generating demand; however, future growth is likely to be fueled by industries and the automotive sector
- Overall enterprise spend for semiconductor engineering has been steadily increasing despite the pandemic, and has reached in excess of US$89 billion worldwide
- US-based firms dominate global sales and contribute to nearly half of the global R&D spend. Korea and China have been leading in capital expenditure

Emerging trends

- Enterprises have set their investment priorities around advances in products such as memory chips and AI chips, and evolving product architectures – 3 nm nodes, 3D stacking, etc.
- The worldwide chip shortage of 2020 has forced enterprises to rethink on their global supply chains, and governments are now aiming toward creating domestic chip self-sufficiency
- Enterprises need to be cognizant of the changes in the post-pandemic market – shifting product demand landscape, unconducive trade environment, and the possibilities of inorganic growth

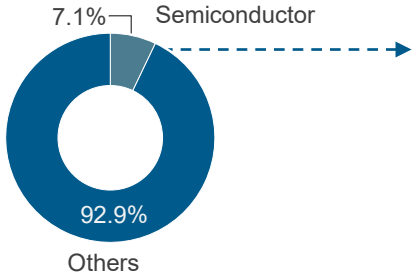
Outsourcing landscape

- Outsourcing spend has increased continuously at a rate of 4-5%, and forms 3.2% of the overall enterprise spend on semiconductor engineering
- The pre-silicon phase experiences the maximum outsourcing and COVID-19 has had minimal impact on the overall business numbers
- Enterprises are increasingly seeking shared ownership engagements in order to mitigate risks and improve business outcomes
- Service providers are making acquisitions to achieve capabilities across service functions for serving turnkey engagements, and to access talent skilled in next-generation technologies of 5G, IoT, AI, etc.

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

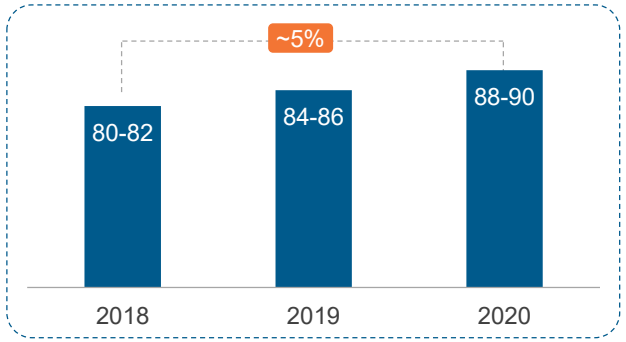
Overall enterprise spending and growth on semiconductor engineering

100% = US$1.25-1.27 trillion



Global semiconductor engineering spend
2018-20; US$ billion

X% CAGR



Semiconductor engineering services market size and growth

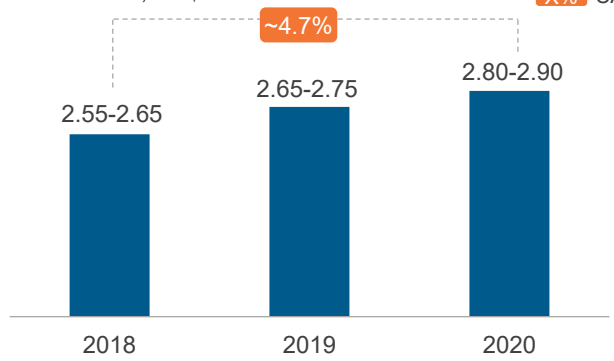
Semiconductor engineering overall spend
CY 2020; 100% ~US$89 billion

Outsourced spend
3.2%

Insourced spend
96.8%

Semiconductor engineering outsourcing spending trend
CY 2018-20; US$ billion

X% CAGR



Source: Everest Group (2021)

Semiconductor engineering services revenue split

Semiconductor engineering services revenue – by geographies
2020; 100% ~US$2.85 billion

North America
45-50%

Europe
10-15%

China, Japan, South Korea, and Taiwan
15-20%

Rest of Asia Pacific
15-20%

Rest of the World
5-10%

Source: Everest Group (2021)

Semiconductor engineering services revenue – by client type
2020; 100% ~US$2.85 billion

40-45%	Fabless firms
35-40%	IDMs
5-10%	Foundries
~5%	EDA tools providers
3-4%	OSAT firms
2-3%	Original equipment manufacturers (OEMs), original design manufacturers (ODMs), IP

Semiconductor engineering services – share of service segments

Semiconductor engineering services outsourcing spend – by service function
2020; 100% = US$2.85 billion

Talent availability against demand Low → High

Service Segments	Design & verification	Validation & testing	Sustenance & value engineering	Other services related to manufacturing
Market prevalence	**50-55%**	**25-30%**	**10-15%**	**5-10%**
	The design & verification segment continues to lead revenue for vendors. However, talent demand for the segment is surging faster than talent availability, primarily due to the rise of next-generation technologies.			
Talent availability against demand[1]	■■■■□□□	■■■■■■□	■■■■■□□	■■■■□□□

1 Based on the average of responses from service providers
Source: Everest Group (2021)

Research calendar
Engineering Services (ES)

Published | Planned | Current release

Flagship reports	Release date
Reaching New Frontiers in Experience-centricity and Resilience: Software Product Engineering Services PEAK Matrix® Assessment 2021	March 2021
Semiconductor Engineering Services PEAK Matrix® Assessment 2021: Enabling the Hyper-connected Intelligent World	March 2021
A Transformational Leap in Cyber-physical Convergence − Industry 4.0 State of the Market Report 2021	April 2021
Exploring the Future of Mobility: Autonomous, Connected, Electric, and Shared (ACES) Mobility Automotive Engineering Services PEAK Matrix® Assessment 2021	September 2021
Reaching New Frontiers in Experience-centricity and Resilience – Software Product Engineering Services State of the Market Report 2021	September 2021
Envisioning the Connected Future: 5G Engineering Services PEAK Matrix® Assessment 2021	September 2021
Enabling the Hyper-connected Intelligent World – Semiconductor Engineering State of the Market Report 2021	**November 2021**
Medical Devices IoT Services PEAK Matrix® Assessment 2021	Q4 2021
Digital Engineering Services PEAK Matrix® Assessment 2022	Q1 2022
Digital Twin Services PEAK Matrix® Assessment 2022	Q1 2022

Thematic reports	Release date
Engineering Services Enterprise Pulse: Are Engineering Enterprises Truly Happy with Their Service Providers?	April 2020
Engineering Services Top 50	June 2020
Extended Reality and Its Applications Across Industries	August 2020
Leading the Pack: Trends for the Top 200 Engineering Research & Development (ER&D) Enterprises 2021	September 2020
Engineering Services Enterprise Sourcing Handbook	Q4 2021
Trailblazers: Cloud Engineering Service Providers	Q4 2021

Note: For a list of all of our published ES reports, please refer to our website page.

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