

Semiconductor Engineering Services PEAK Matrix[®] Assessment 2021: Enabling the Hyper-connected Intelligent World

Focus on HCL Technologies
May 2021



Background and introduction of the research

Semiconductors form 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 witnessing significant ER&D investments driven by areas such as increasing adoption of AI chips, proliferation of IoT and connected devices, and shift to 3 nanometer (3nm) technology. Semiconductor enterprises face challenges in catering to 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, IDMs, and foundries across needs of product development, fabrication, testing, and lifecycle management. Semiconductor engineering service offerings span four service functions, which broadly capture the semiconductor industry value chain:

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

This research is the first edition of Everest Group's Semiconductor Engineering Services PEAK Matrix® Assessment, wherein we have presented an assessment of 16 engineering service providers featured on the PEAK Matrix®, along with the sourcing considerations for enterprises. This assessment is based on the RFI responses from service providers, interactions with their semiconductor engineering leadership, client reference checks, and an ongoing analysis of the engineering services market.

This report assesses the following 16 leading engineering service providers featured on the semiconductor engineering PEAK Matrix®:

- **Leaders:** Capgemini, HCL Technologies, LTTS, TCS, and Wipro
- **Major Contenders:** Alten, Cyient, HARMAN, QuEST Global, Synapse Design, Tata Elxsi, Tech Mahindra, and UST
- **Aspirants:** Invecas, Mirafra Technologies, and VVDN Technologies

Scope of this report:



Geography
Global



Service providers
16 leading broad-based and pure-play engineering service providers



Services
Semiconductor engineering services

Semiconductor Engineering Services PEAK Matrix® characteristics

Leaders:

Capgemini, HCL Technologies, LTTS, TCS, and Wipro

- The Leaders segment comprises both pure-play as well as broad-based IT-heritage firms that have developed a strong suite of comprehensive capabilities spanning all four semiconductor service functions
- Leaders have explored both organic and inorganic growth routes to develop strong competence across all the elements of semiconductor engineering value chain
- These players lay extensive focus on innovation and next-generation themes pertaining to semiconductor engineering. They cater to a strong portfolio of clients across all major geographies backed by their international delivery presence helping them achieve the perfect mix of client proximity and cost advantages in servicing large-scale engagements

Major Contenders:

Alten, Cyient, HARMAN, QuEST Global, Synapse Design, Tata Elxsi, Tech Mahindra, and UST

- Major Contenders comprise both IT-heritage firms as well as pure-play engineering service providers
- These players have also been exploring the inorganic route to enhance their capabilities and expand their delivery presence
- They have demonstrated the ability to win large deals, driven by their wide partnership ecosystem, flexible engagement constructs, and focused investments. They have also developed proprietary offerings across select service functions; however, their service portfolios are not as comprehensive across all the service functions as those of Leaders

Aspirants:

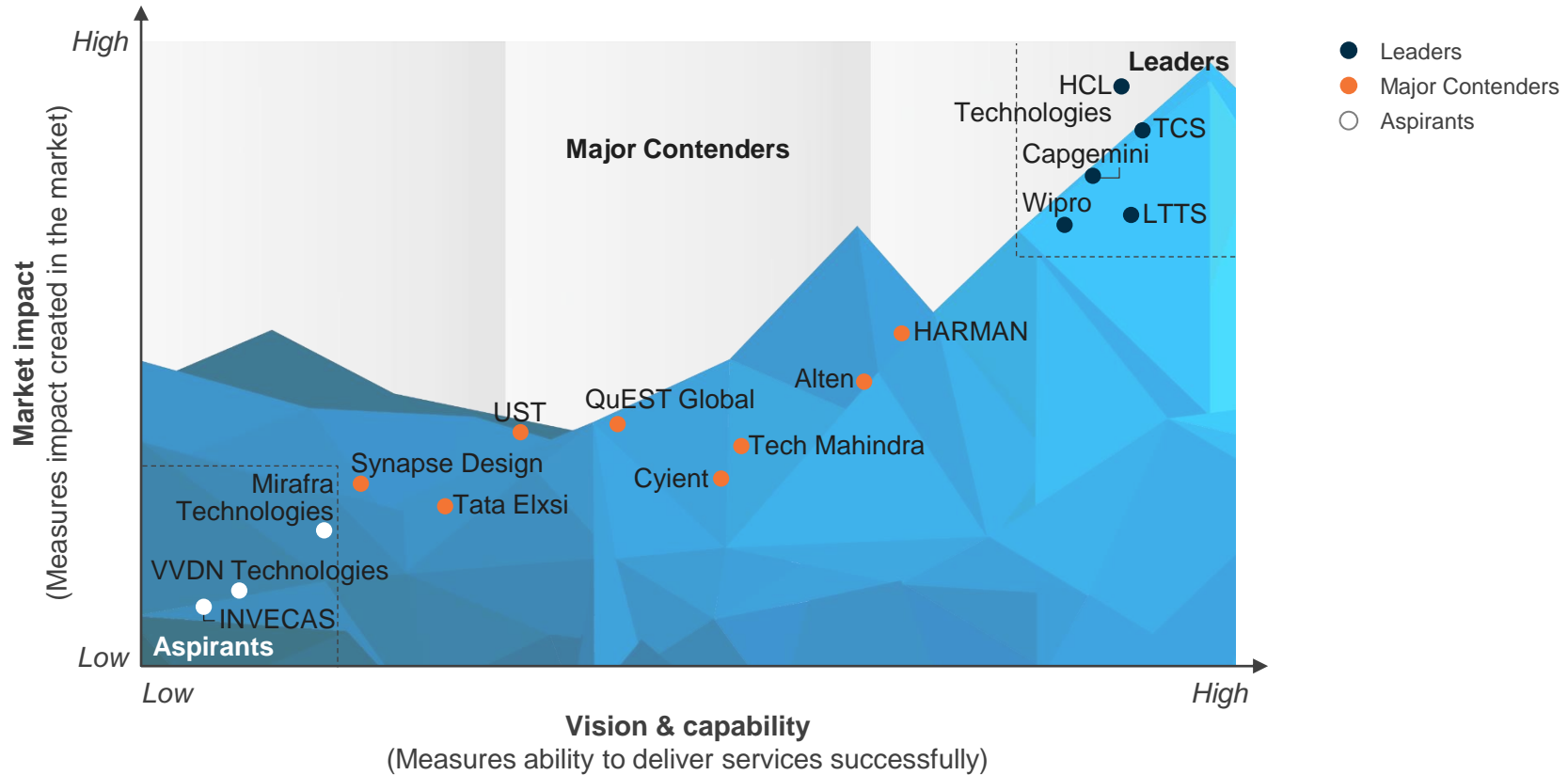
Invecas, Mirafr Technologies, and VVDN Technologies

- Aspirants possess strong expertise in specific pockets of value chain elements and have a relatively limited portfolio of pointed IP solutions
- While they have a limited appetite toward inorganic growth, they actively pursue partnerships with the ecosystem players to enhance their capabilities

Everest Group PEAK Matrix®

Semiconductor Engineering Services PEAK Matrix® Assessment 2021 | HCL Technologies positioned as Leader

Everest Group Semiconductor Engineering Services PEAK Matrix® Assessment 2021¹



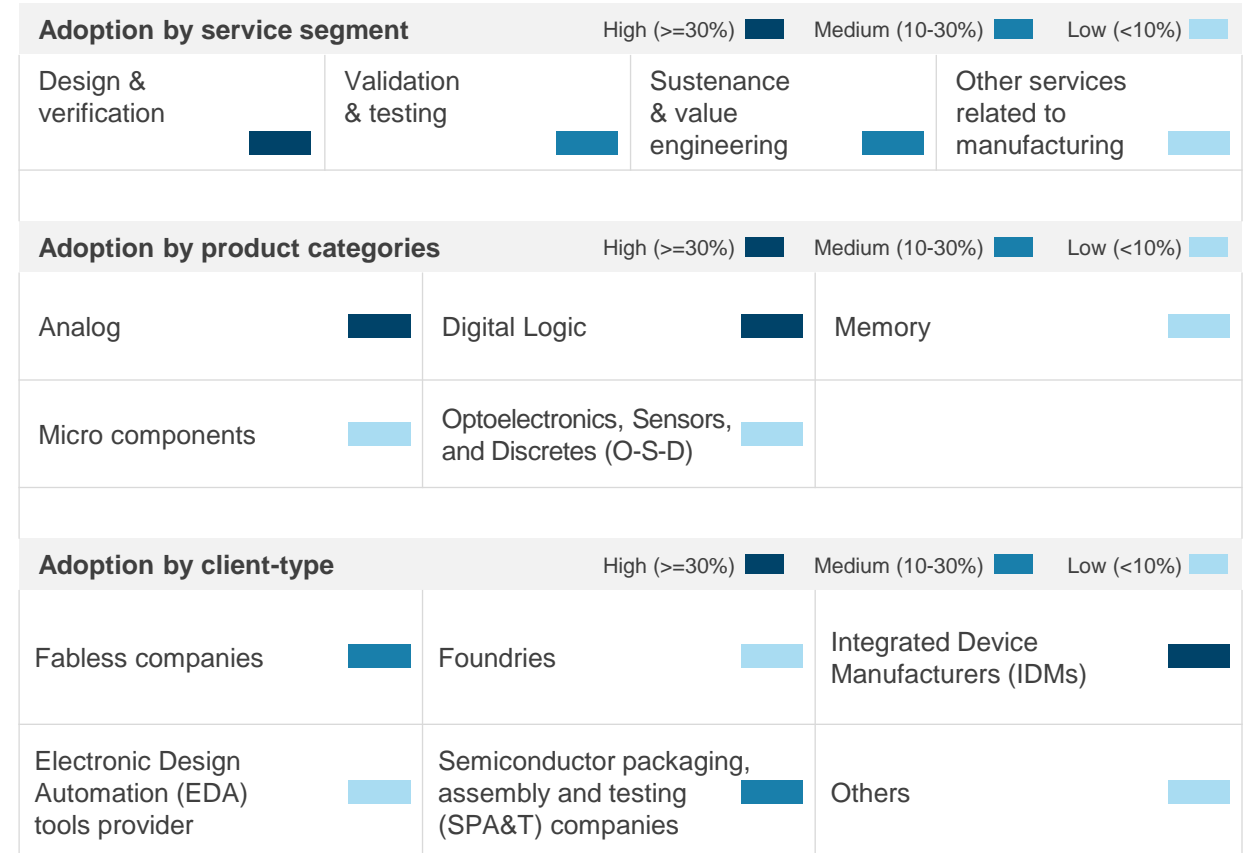
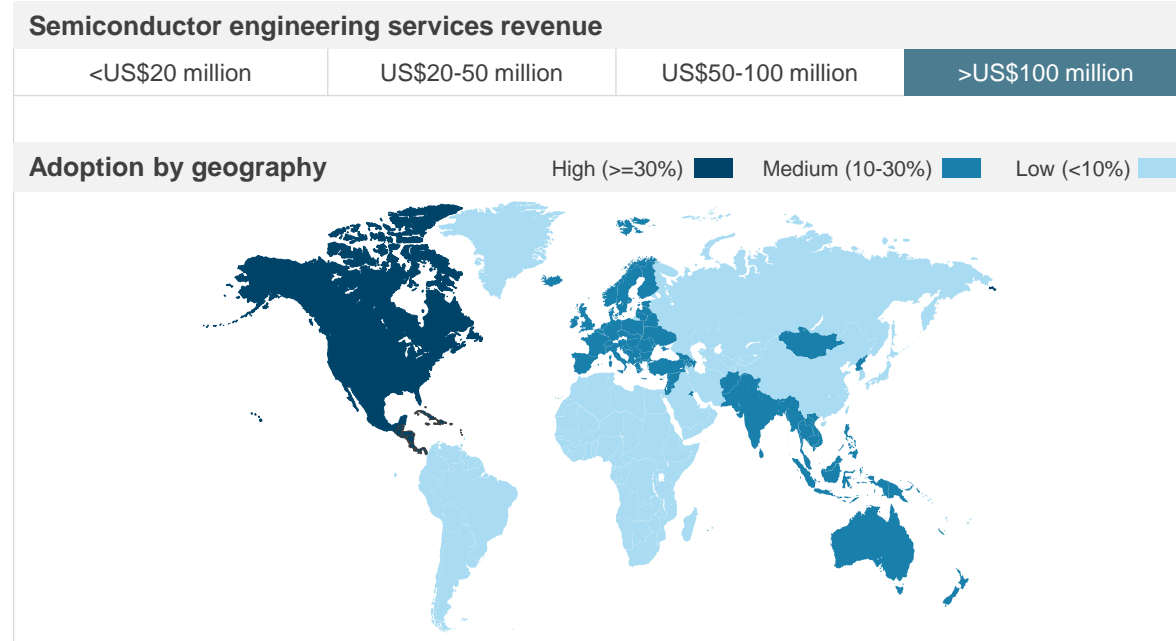
¹ Assessments for Alten, INVECAS, Mirafra Technologies, QuEST Global, Synapse Design, Tata Elxsi, and VVDN Technologies exclude service provider inputs and are based on Everest Group's proprietary Transaction Intelligence (TI) database, service provider public disclosures, and Everest Group's interaction with buyers

Source: Everest Group (2021)

HCL Technologies | semiconductor engineering services profile (page 1 of 4)

Overview

Vision & strategy: HCL Technologies' vision is to be the preferred innovation partner for OEMs, chip design houses, and fabrication facilities. It aims to leverage its domain knowledge, customer-centric engagement models, and over 25 years of experience in this space to help customers bring innovative products to the market faster.



HCL Technologies | semiconductor engineering services profile (page 2 of 4)

Case studies and solutions

Case study 1 **Helped a leading semiconductor company develop turnkey image processing System-on-Chip (SoC) for mobile and IoT**

Business challenge
 The client was looking for a reliable engineering partner to lead the program on turnkey basis, to develop a new image co-processor to work along with application processor.

Solution and impact
 HCL put together a team of functional managers for each activity such as SoC integration, emulation, pre-silicon verification, Design For Test (DFT) , physical design, and post-silicon validation. It ensured complete delivery within eight months, reduced verification cycle time by eight weeks, and improved confidence by 20% due to formal verification. Also, the first tape-out is out for volume production.

Case study 2 **Helped a leading semiconductor company develop server derivative chip**

Business challenge
 The client wanted to develop a derivative SoC variant of an existing server chip at 14nm technology node.

Solution and impact
 HCL was involved in the complete turnkey execution ownership right from Register Transfer Level (RTL) design, verification, DFT, physical design, analog design, to functional safety verification. HCL helped achieve target frequency of 2.5 GHz and SoC size larger than 350 square millimeters. It ensured quick ramp-up of team that enabled faster time-to-market.

Proprietary digital solutions (representative list)	
Solution	Details
Device Development Next (DDx)	A set of device-centric solutions that enable organizations to overcome product development challenges. It comprises reusable components, engineering accelerators (hardware & software), best practices, and relevant domain-specific nuances.
Electronic Device Embedded Testing (eDAT)	A platform for automated testing of electronic devices facilitating testing across industries and different environments through a common framework.
IP-XACT framework	A framework that provides IP-XACT-based generators such as RTL source code for control and status registers (CSR) and simulation scripts for productivity improvements.
Post-Silicon Validation (PSV) framework including emulation / FPGA prototyping	A platform that accelerates the IC design and development cycle by mimicking the real silicon performance on equivalent silicon hardware platform, helping designers to identify the silicon bugs in early stages, and fix them before foundry tape-out.
Printed Circuit Board (PCB) automation	A solution that helps reduce PCB design time with the help of automation scripts.
Silicon proven analog & mixed signal IPs	A portfolio of silicon proven analog & mixed signal IPs in input/output (I/O), high speed serializer-deserializer (SerDes), data convertors, clock, and power management, among others.
VeriFast framework	A framework to accelerate functional verification consisting of reusable components, libraries, and automation tools leading to more than 20% reduction in effort of test bench setup.

HCL Technologies | semiconductor engineering services profile (page 3 of 4)

Investments and partnerships

Key alliances and partnerships (representative list)

Partner name	Details
Arm	An Arm approved design center partnership, enabling HCL to have access to latest IPs and processor cores.
Broadcom	A global services partnership for consulting, implementation, upgrade, support, and cybersecurity services.
EDA vendors	Partnerships with leading EDA tools and IP vendors, which enables HCL to deliver turnkey silicon development in-house and get trained in latest tools and technologies.
IIT Madras	A partnership with IIT Madras for research & innovation around RISC-V processors.
Intel	An affiliate member of the Intel FPGA design solutions network.
NXP India	A Memorandum of Understanding (MoU) for next-generation advanced electronics and semiconductor product development to co-develop automotive products for global automotive customers.
TSMC	An alliance leveraging TSMC Design Center enabling it to provide turnkey silicon services.
Xilinx	A certified member of Xilinx alliance program to help mutual customers develop products faster on targeted design platforms. The partnership also focuses on offering configurable backhaul modems targeting 5G access and mobile backhaul markets, enabling telecom OEMs to meet stringent requirements of next-generation networks.










Recent semiconductor engineering services investments/acquisitions (representative list)

Investment/target	Company description
CoEs	Invested in CoEs in areas such as 5G, imaging, IoT, analytics, security, mobility, wireless, SDN/NFV, and DevOps, which customers can leverage for quick solution building and domain specific solutions.
Lab infrastructure	Invested over \$50 million in setting-up an in-house clean room and various labs including silicon testers, logic analyzers, signal generators, thermal heads, and chillers. These in-house labs significantly improve turnaround time as well as time to market for the customers.
Patents and joint IP development	Invested in numerous joint IP development with customers/partners in next-generation themes as well as for creating domain centric solutions. Some of these engagements also involve GTM partnerships. HCL has filed over 1,500 patents and IP solutions including those filed on behalf of customers.
Sankalp Semiconductor	Acquired Sankalp Semiconductor to further enhance semiconductor services and help customers provide a wide range of analog and mixed-signal services.
Training & capability development	Invested in talent building initiatives focused on developing capabilities across semiconductor products, services and systems, including 5nm chip development.

HCL Technologies | semiconductor engineering services profile (page 4 of 4)

Everest Group assessment – Leader

Measure of capability:  High  Low

Market impact				Vision & capability				
Market Adoption	Portfolio mix	Value delivered	Overall	Vision and strategy	Scope of services	Innovation & investments	Delivery Footprint	Overall
								

Strengths

- Well-diversified portfolio of offerings covering all the service segments and product categories and targeting all the major geographical regions
- Balanced mix of client portfolio spread across small, mid-sized, and large enterprises
- High flexibility in pricing constructs and willingness toward emerging pricing models such as outcome based, risk reward, and revenue sharing
- Strong growth momentum, backed by consistent investments in capability enhancing acquisitions, IP development, co-innovation partnerships, and infrastructure establishments

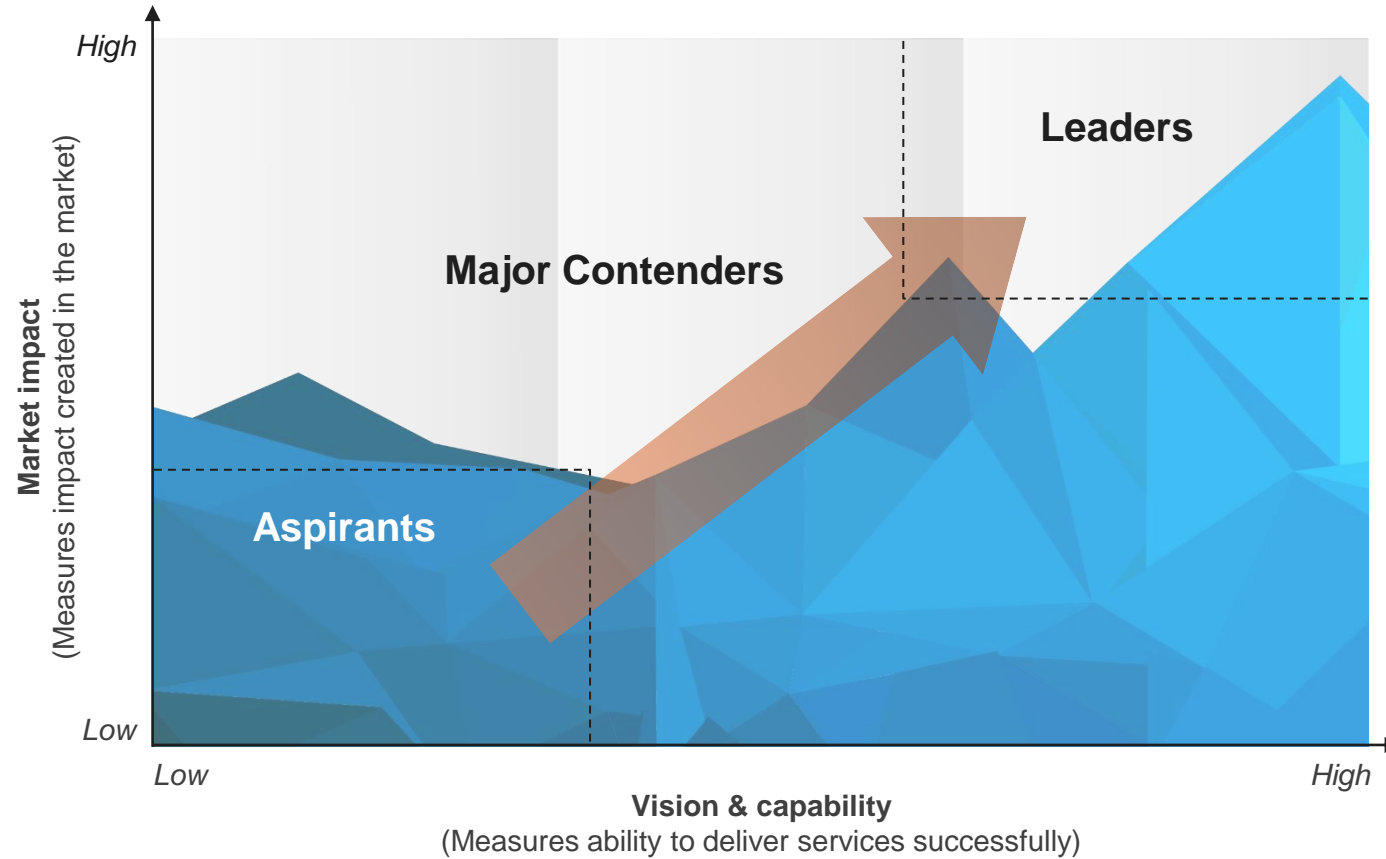
Limitations

- While HCL has decent delivery footprint in onshore and offshore locations, its presence in nearshore locations is limited
- Clients would like HCL to improve its project management capabilities in terms of offering better scheduling and transparency
- Scope for further improvement with regards to investing in dedicated programs to train and scale up resources in domain-specific skills and knowledge as compared to Leaders

Appendix

Everest Group PEAK Matrix® is a proprietary framework for assessment of market impact and vision & capability

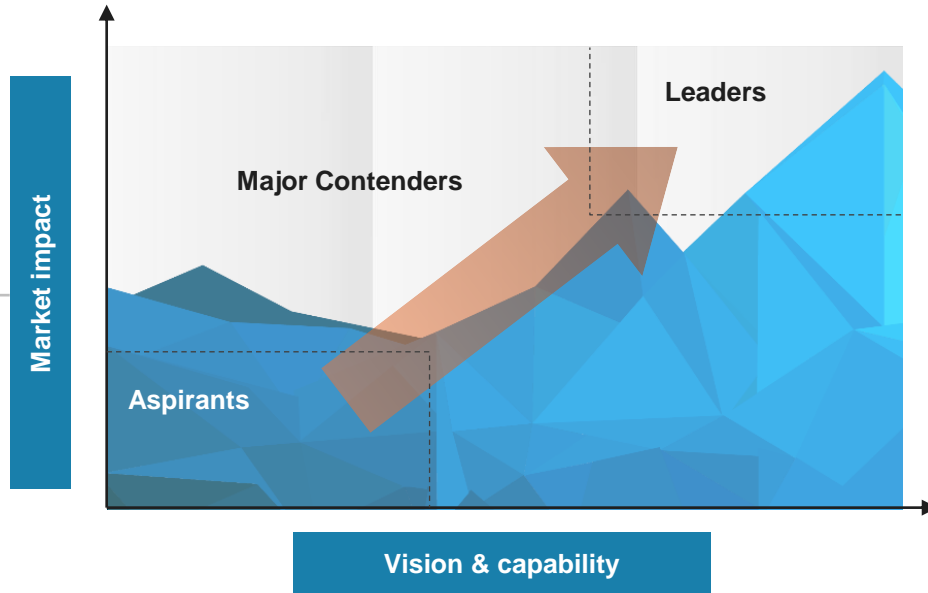
Everest Group PEAK Matrix



Services PEAK Matrix® evaluation dimensions

Measures impact created in the market – captured through three subdimensions

- Market adoption**
Number of clients, revenue base, YOY growth, new client wins, prominent pricing models, and deal value
- Portfolio mix**
Diversity of client/revenue base across geographies, verticals and type of clients
- Value delivered**
Value delivered to the client based on customer feedback and transformational impact



Measures ability to deliver services successfully. This is captured through four subdimensions

- Vision and strategy**
Vision for the client and itself; future roadmap and strategy
- Scope of services offered**
Depth and breadth of services portfolio across service subsegments/processes
- Innovation and investments**
Innovation and investment in the enabling areas, e.g., technology IP, industry/domain knowledge, alliances, M&A, and service enablement
- Delivery footprint**
Delivery footprint and global sourcing mix

FAQs

Does the PEAK Matrix® assessment incorporate any subjective criteria?

Everest Group's PEAK Matrix assessment adopts an unbiased and fact-based approach (leveraging service provider / technology vendor RFIs and Everest Group's proprietary databases containing providers' deals and operational capability information). In addition, these results are validated / fine-tuned based on our market experience, buyer interaction, and provider/vendor briefings

Is being a “Major Contender” or “Aspirant” on the PEAK Matrix, an unfavorable outcome?

No. The PEAK Matrix highlights and positions only the best-in-class service providers / technology vendors in a particular space. There are a number of providers from the broader universe that are assessed and do not make it to the PEAK Matrix at all. Therefore, being represented on the PEAK Matrix is itself a favorable recognition

What other aspects of PEAK Matrix assessment are relevant to buyers and providers besides the “PEAK Matrix position”?

A PEAK Matrix position is only one aspect of Everest Group's overall assessment. In addition to assigning a “Leader”, “Major Contender,” or “Aspirant” title, Everest Group highlights the distinctive capabilities and unique attributes of all the PEAK Matrix providers assessed in its report. The detailed metric-level assessment and associated commentary is helpful for buyers in selecting particular providers/vendors for their specific requirements. It also helps providers/vendors showcase their strengths in specific areas

What are the incentives for buyers and providers to participate/provide input to PEAK Matrix research?

- Participation incentives for buyers include a summary of key findings from the PEAK Matrix assessment
- Participation incentives for providers/vendors include adequate representation and recognition of their capabilities/success in the market place, and a copy of their own “profile” that is published by Everest Group as part of the “compendium of PEAK Matrix providers” profiles

What is the process for a service provider / technology vendor to leverage their PEAK Matrix positioning and/or “Star Performer” status ?

- Providers/vendors can use their PEAK Matrix positioning or “Star Performer” rating in multiple ways including:
 - Issue a press release declaring their positioning. See [citation policies](#)
 - Customized PEAK Matrix profile for circulation (with clients, prospects, etc.)
 - Quotes from Everest Group analysts could be disseminated to the media
 - Leverage PEAK Matrix branding across communications (e-mail signatures, marketing brochures, credential packs, client presentations, etc.)
- The provider must obtain the requisite licensing and distribution rights for the above activities through an agreement with the designated POC at Everest Group.

Does the PEAK Matrix evaluation criteria change over a period of time?

PEAK Matrix assessments are designed to serve present and future needs of the enterprises. Given the dynamic nature of the global services market and rampant disruption, the assessment criteria are realigned as and when needed to reflect the current market reality as well as serve the future expectations of enterprises



Everest Group is a consulting and research firm focused on strategic IT, business services, engineering services, and sourcing. Our clients include leading global enterprises, service providers, and investors. Through our research-informed insights and deep experience, we guide clients in their journeys to achieve heightened operational and financial performance, accelerated value delivery, and high-impact business outcomes. Details and in-depth content are available at [everestgrp.com](https://www.everestgrp.com).

Stay connected

Website

[everestgrp.com](https://www.everestgrp.com)

Social Media

-  @EverestGroup
-  @Everest Group
-  @Everest Group
-  @Everest Group

Blog

[everestgrp.com/blog](https://www.everestgrp.com/blog)

Podcast

DigitalReallTy



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

New York

info@everestgrp.com
+1-646-805-4000

Toronto

canada@everestgrp.com
+1-647-557-3475

This document is for informational purposes only, and it is being provided "as is" and "as available" without any warranty of any kind, including any warranties of completeness, adequacy, or fitness for a particular purpose. Everest Group is not a legal or investment adviser; the contents of this document should not be construed as legal, tax, or investment advice. This document should not be used as a substitute for consultation with professional advisors, and Everest Group disclaims liability for any actions or decisions not to act that are taken as a result of any material in this publication.