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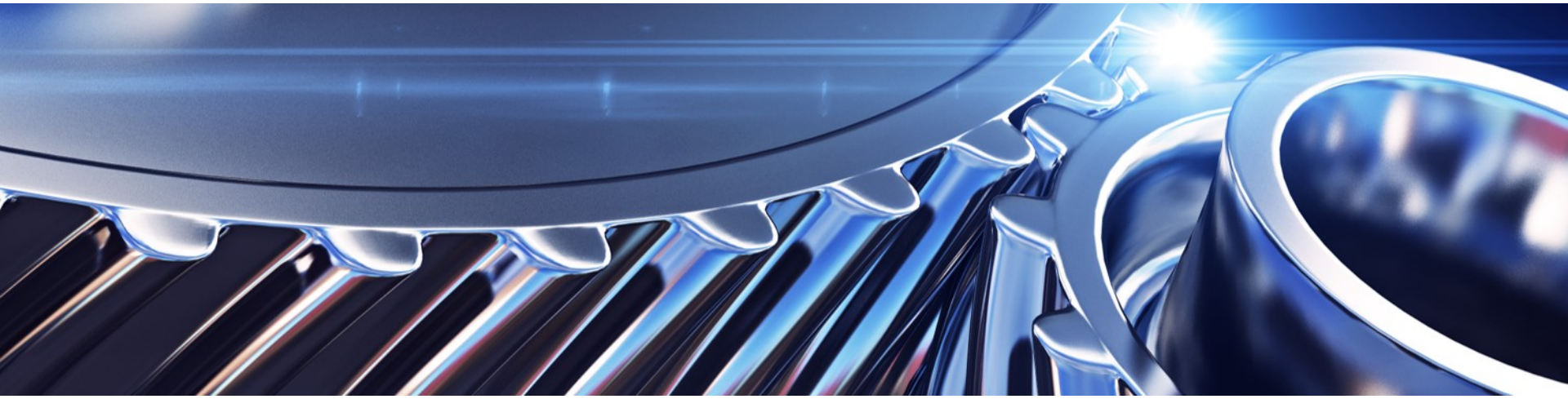

Designing Products in the Age of Human-Machine Nexus for the Global Connected Ecosystem

Engineering Services (ES)

June 2017

Our research offerings for global services

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  Global services tracking across functions, sourcing models, locations, and service providers – industry tracking reports also available

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Subscription information

- This report is included in the following subscription(s)
  - **Engineering Services**
- In addition to published research, a subscription may include analyst inquiry, data cuts, and other services
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Custom research capabilities

- Benchmarking | Pricing, delivery model, skill portfolio
- Peer analysis | Scope, sourcing models, locations
- Locations | Cost, skills, sustainability, portfolio – plus a tracking tool
- Tracking services | Service providers, locations, risk
- Other | Market intelligence, service provider capabilities, technologies, contract assessment

Corporate Headquarters
Office: +1-214-451-3000
info@everestgrp.com

European Headquarters
Office: +44-207-129-1318
unitedkingdom@everestgrp.com

Delhi Office
Office: +91-124-284-1000
india@everestgrp.com

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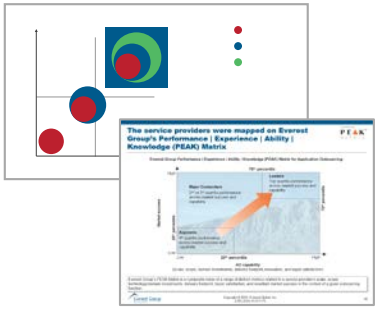
Our research methodology is based on four pillars of strength to produce actionable and insightful research for the industry

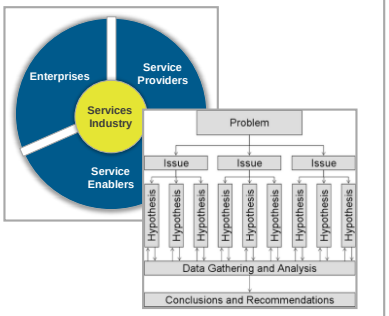
- Market thought leadership
- Actionable and insightful research
- Syndicated and custom research deliverables

1 Robust definitions and framework
(PEAK Matrix™, market maturity, and technology adoption/investment)

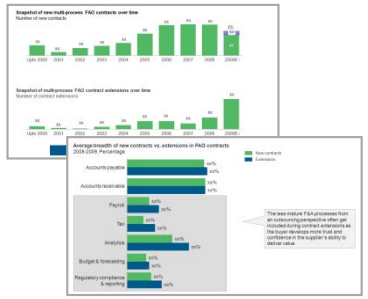


2 Primary sources of information
(Annual, contractual and operational RFIs, service provider briefings and buyer interviews, and web-based surveys)

3 Diverse set of market touchpoints
(Ongoing interactions across key stakeholders, input from a mix of perspectives and interests, supports both data analysis and thought leadership)



4 Fact-based research
(Data-driven analysis with expert perspectives, trend-analysis across market adoption, contracting, and service providers)



- Proprietary contractual database of large active contracts (updated annually)
- Year-round tracking of 25+ service providers
- Dedicated team for engineering services research
- Over 20 years of advising clients in IT, BPO, and engineering decisions
- Executive-level relationships with buyers, service providers, technology providers, and industry associations

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Overview and abbreviated summary of key messages

Increasing levels of interaction and intelligence built into machines, tools, and devices is creating a "new paradigm"- the age of human-machine nexus. To keep pace with this evolving model, enterprises need to adopt an ecosystem-centred design thinking approach for strategizing and crafting better value proposition in their products.

This report explores the ecosystem-centred design thinking approach, and delves into its constituents, the underlying principles, and the impact on businesses. It also covers some of the current and prospective examples for ecosystem-based design thinking, and discusses the challenges that enterprises need to overcome for successfully implementing this approach.

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

- Technology is moving to a state of "omnipresence" and multiple ambient technology components are getting inter-connected to form a global connected ecosystem.
- New age disruptive business models see an increasing adoption of technologies such as machine learning, artificial intelligence, and data analytics.
- Current human-centered design thinking approach needs to be upgraded and aim to solve complex business problems using a human-machine nexus approach.
- Enterprises are rapidly accepting ecosystem-centered design thinking approach as a lever to meet the challenges of evolving consumer preferences and drive competitive advantage in the industry.
- Ecosystem-centered design thinking approach focuses not only on collective ideation but also on enabling collective creativity and improving the utility and sustainability of the products, thus aligning with business objectives.
- Alarming concerns around the ecosystem-centered approach are security concerns over open ecosystem, lack of skill and expertise, integration challenges with traditional systems and resistance to change in enterprises.

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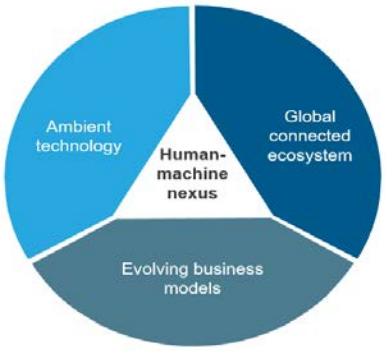
This study offers a deep dive into the key aspects of human-machine nexus and ecosystem-centred thinking approach; below snapshots illustrate the depth of analysis of this report

Human-Machine Nexus and its enabling factors

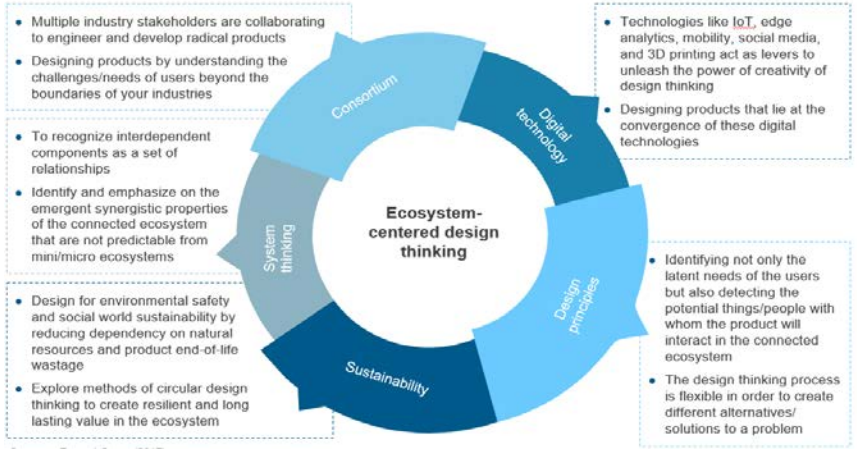


Technology is becoming extensively pervasive and is moving to a state of "omnipresence"—present everywhere but less visible to the end-user. It is evolving to become an inextricable layer in every human activity and will scale across all consumer and industrial/commercial areas.

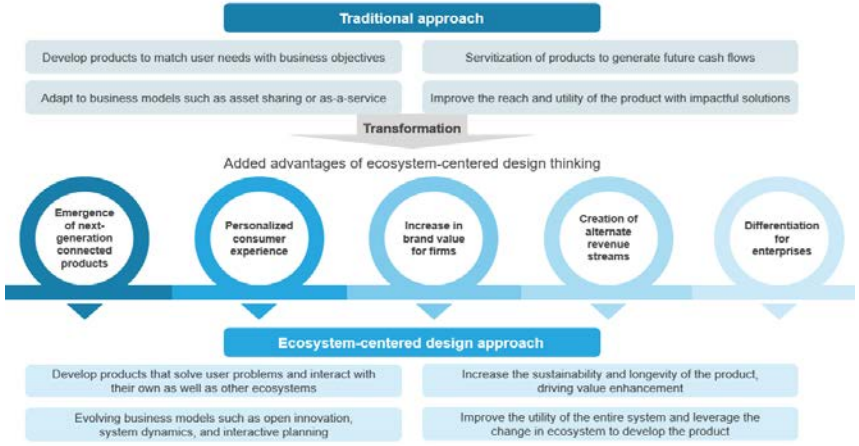
The ambient technology components from multiple micro ecosystems are now getting linked to form a global connected ecosystem. The ambient nature of technology compels enterprises to think about the connecting elements for these devices on account of the rise of open standards and connectivity frameworks.

Over the past few years we have seen an emergence of business models that are utilizing the evolving ambient technology in the budding global connected ecosystem. These disruptive models are reshaping the consumer preferences across all the industries.

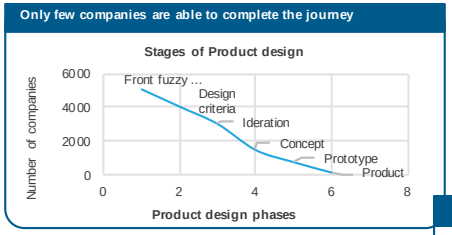
Ecosystem-centered design thinking approach principles

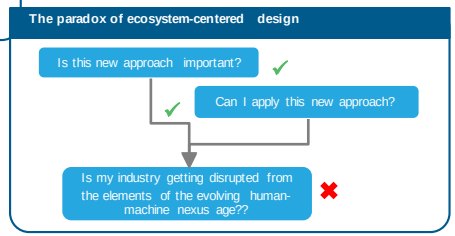


Impact of Ecosystem-centered design thinking approach



Challenges to ecosystem-centered design thinking approach





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Glossary of key terms used in this report

Term	Definition
Ambient technology	Ambient technology enables an environment where devices merge closely with the surroundings to create a seamless experience for the user. The term often used to describe such technology is “omnipresence”, i.e. an impact of technology everywhere without being visible to the end-user
Artificial Intelligence	Artificial Intelligence is the development of computer systems to perform tasks that normally require human intelligence, such as visual perception, speech recognition, and translation between language
Ecosystem	A community comprising living creatures interacting with each other and the physical environment around them; in a more technical sense, an ecosystem refers to a complex network constituted by interconnected smaller systems
Servitization	Servitization is a transformation journey - it involves firms (often manufacturing firms) developing the capabilities they need to provide services and solutions that supplement their traditional product offerings.
Engineering Services	Engineering Services include all activities involved in the development of a new product – hardware or software
Global sourcing / offshoring	Transferring business process activities or its complete ownership to a different country where the company receiving the service is located, is referred to as offshoring or global sourcing
IoT	Internet of Things is the internetworking of physical devices, vehicles, buildings and other items through sensors, software, and network connectivity
Machine learning	Machine learning provides computers with the ability to learn without being explicitly programmed. It focuses on the development of computer programs that can evolve when exposed to new data
Peer-to-Peer (P2P)	P2P models comprise decentralized transactions where two individuals interact to buy or sell goods and services without intermediation by any company of business
Service provider	A company/entity that provides outsourcing services to another company/entity

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Engineering Services research calendar

Published Current

Topic	Release date
Innovation Beyond Borders – Global Talent Hotspots for Engineering Services and Research & Development (ER&D)	August 2016
The Evolving Demand Paradigm in the Engineering and Research and Development (ER&D) Services Industry	November 2016
In Pursuit of Product Excellence: Quality Management in the Engineering Services Industry	May 2017
Identifying the Right Partners for Quality Management in the Engineering Services Industry – Service Provider Landscape	May 2017
Reimagining Design Thinking for the Human-Machine Nexus in the Global Connected Ecosystem	June 2017

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Additional research references

The following documents are recommended for additional insight into the topic covered in this report. The recommended documents either provide additional details on the topic or complementary content that may be of interest

1. **In Pursuit of Product Excellence: Quality Management in the Engineering Services Industry** (EGR-2017-0-R-2181); 2017. This report provides a detailed analysis of quality management activities in the engineering services industry. It covers market landscape of quality management services and focuses on the central idea of how digital technology themes are reshaping the way enterprises look at their product quality management efforts in the engineering services industry.

2. **The Evolving Demand Paradigm in the Engineering and Research and Development (ER&D) Services Industry** (EGR-2016-0-R-1977); 2016. This report provides an overview of the ER&D services industry. It covers demand trends in the ER&D services industry across different industry verticals and global sourcing trends across major ER&D segments

3. **Creating Enterprise Wealth with IoT** (EGR-2016-4-V-1867); 2016. This report examines the rationale behind IoT adoption and the different moving parts of the enterprise for each category

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

H Karthik, Partner — h.karthik@everestgrp.com
Chirajeet Sengupta, Partner — chirajeet.sengupta@everestgrp.com
Ronak Doshi, Practice Director — ronak.doshi@everestgrp.com
Abhishek Gupta, Senior Analyst — abhishek.gupta@everestgrp.com
Mayank Maria, Senior Analyst — mayank.maria@everestgrp.com

Website: www.everestgrp.com | Phone: +1-214-451-3000 | Email: info@everestgrp.com

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From **insight** to ***action***.

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Everest Group is a consulting and research firm focused on strategic IT, business services, and sourcing. We are trusted advisors to senior executives of leading enterprises, providers, and investors. Our firm helps clients improve operational and financial performance through a hands-on process that supports them in making well-informed decisions that deliver high-impact results and achieve sustained value. Our insight and guidance empower clients to improve organizational efficiency, effectiveness, agility, and responsiveness. What sets Everest Group apart is the integration of deep sourcing knowledge, problem-solving skills and original research. Details and in-depth content are available at www.everestgrp.com.

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

Bangalore
india@everestgrp.com
+91-804-276-4533

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
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