The Evolving Demand Paradigm in the Engineering and Research and Development (ER&D) Services Industry

Market Report – November 2016: Preview deck

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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

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1   Banking, financial services, and insurance

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Methodology – Everest Group's extensive databases, proprietary market intelligence, and inputs from market participants formed the foundation for this report

- Proprietary intelligence
- Market thought leadership
- Actionable and insightful research

1 Robust definitions and frameworks – location assessment, sustainability, and scalability

2 Proprietary databases (GICs, service providers, market activity, cost/labor, and transaction intelligence)

3 Diverse set of touch-points with key global-services stakeholders for on-the-ground perspectives

4 Fact-based research adequately informed by deep domain expertise and experience

- A dedicated team for global sourcing research, comprehensively supporting all location-related requirements of clients (information, strategy, tracking, etc.)
- Comprehensive, year-round tracking of global sourcing activity across outsourcing transactions, locations, GICs, and service providers
- More than 20 years of advising clients on global sourcing decisions spanning strategy, optimization, and implementation
- Executive-level relationships with buyers, service providers, country/industry associations, and other industry stakeholders (recruiters, real estate firms, and legal firms)

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Background and scope of the report

Background of the report
- The ER&D services industry covers all activities that are involved in the creation of new products (hardware or software) – product conceptualization, design, development, testing, manufacturing, and maintenance **(detailed value chain covered on page 9)**
- The evolving customer demand and the changing technology landscape is fundamentally transforming the ER&D services industry
  - New-age technologies such as digital, Internet of Things (IoT), and Artificial Intelligence(AI) are increasingly getting integrated with engineering products and transforming the industry landscape
  - These technologies are changing the ER&D services landscape for all major segments – software, mechanical, hi-tech, and industrial and energy **(details on major segments are covered on page 10)**
- ER&D global sourcing industry refers to all outsourced and offshored ER&D activities in offshore/nearshore sourcing locations. It excludes domestic and onshore ER&D operations
- With the evolution of the ER&D global sourcing market, the drivers for sourcing ER&D services have changed considerably
- Multiple factors are driving enterprises to increase outsourcing of ER&D services – accessing skilled talent, accelerate speed-to-market for products, and localize existing products for new markets

Scope of the report
This research covers the following elements:
- Definition of the ER&D services industry and major segments
- Demand drivers in the ER&D services market
  - This includes demand drivers for the overall industry and the different segments
- ER&D global services market landscape
  - Size and growth of the ER&D global sourcing market
  - Evolution of the ER&D global services industry over the years
  - Size of the industry by segments, delivery geography, and the delivery model
- Demand drivers for ER&D services sourcing
  - Demand drivers for ER&D services sourcing across segments
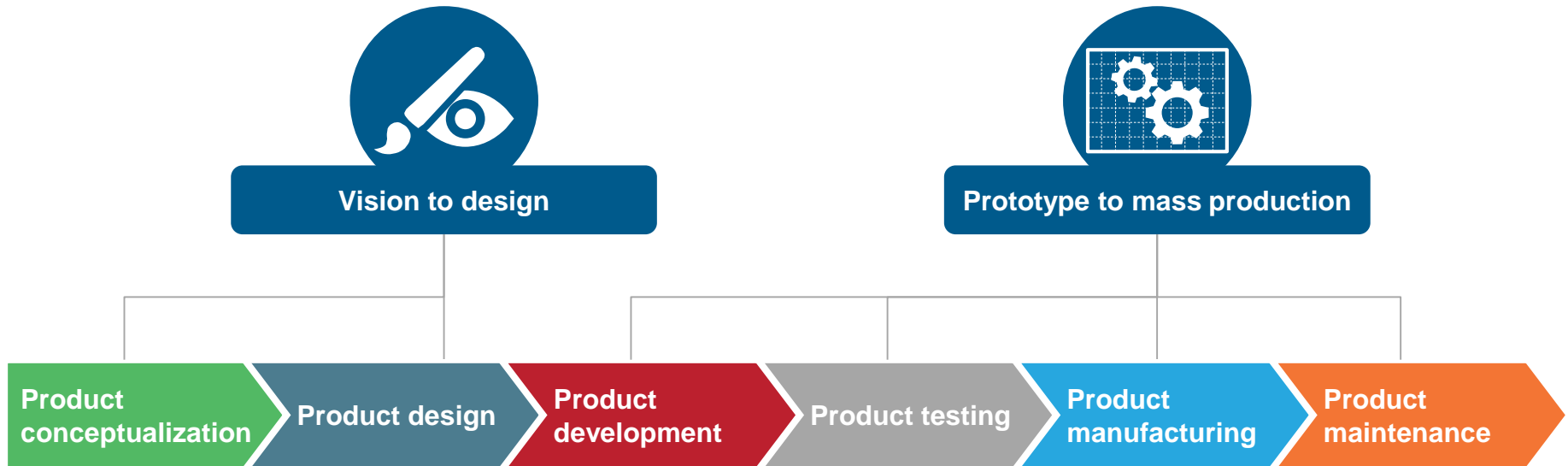- Future outlook for the ER&D global services industry and implications for players

Methodology of the report
The research is anchored on interactions with multiple service providers and GICs, augmented with Everest Group's expertise and proprietary Transaction Intelligence database and Service Provider Tracking both of which are updated quarterly.

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What is Engineering and Research & Development (ER&D)?

ER&D encompasses all processes and activities involved in development of products (hardware or software)
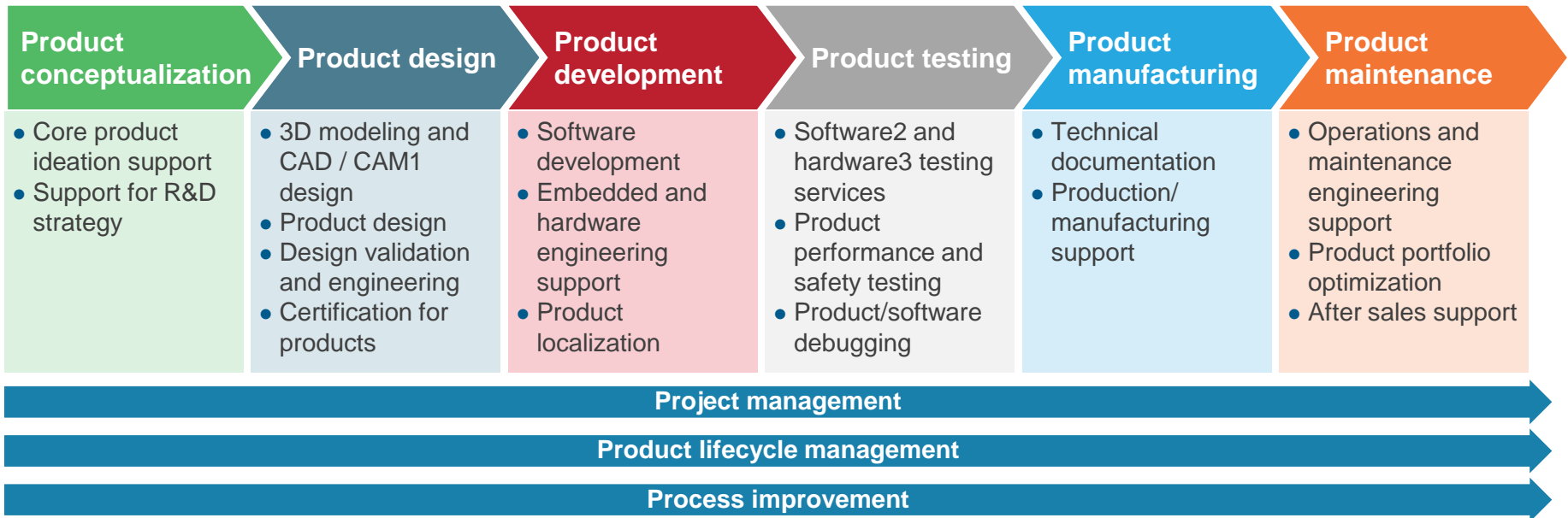
Vision to design

Prototype to mass production

| Product conceptualization | Product design | Product development | Product testing | Product manufacturing | Product maintenance |

1   In the ER&D services value chain, software-related services include developing all Commercially Off The Shelf (COTS) products and does not include System Integration (SI), custom application development, maintenance, and testing
2   Hardware includes all physical components including tools, computer hardware, electronic hardware, networking hardware, and other such physical products or product components

Source: Everest Group (2016)

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What are ER&D services?

ER&D services refer to all processes and activities that **support** the creation of products

Product conceptualization	Product design	Product development	Product testing	Product manufacturing	Product maintenance
• Core product ideation support • Support for R&D strategy	• 3D modeling and CAD / CAM1 design • Product design • Design validation and engineering • Certification for products	• Software development • Embedded and hardware engineering support • Product localization	• Software2 and hardware3 testing services • Product performance and safety testing • Product/software debugging	• Technical documentation • Production/ manufacturing support	• Operations and maintenance engineering support • Product portfolio optimization • After sales support

Project management →

Product lifecycle management →

Process improvement →

1 Computer Aided Manufacturing / Computer Aided Design
2 In the ER&D services value chain, software-related services include developing all Commercially Off The Shelf (COTS) products and does not include System Integration (SI), custom application development, maintenance, and testing
3 Hardware includes all physical components including tools, computer hardware, electronic hardware, networking hardware, and other such physical products or product components

Source: Everest Group (2016)

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This report covers four industry clusters comprising 13 industry segments that account for over 90% of the annual global ER&D services spend

The following taxonomy is used to define the industry clusters and segments referred to in this research report

Cluster	Segment	Definition
Software	Software products	Development, testing, and maintenance of software products
Mechanical	Automotive	Design, manufacturing support, and operations support for automobiles, motorcycles, trucks / heavy engine, and their engineering systems
	Aerospace and defence	Design, manufacturing support, and operations support for aircrafts, space crafts, and their engineering systems
	Marine	Design, manufacturing support, and operations support for boats, ships, other marine vessels / vehicles, and their engineering systems
Hi-tech	Semiconductors	Design, development support, and engineering services for embedded systems and semiconductor devices
	Telecom	Design, manufacturing support, and operations support services for telecom and networking equipment (routers, switches, modems, etc.)
	Consumer electronics	Design, manufacturing support, and post-production support for direct-consumer equipment and appliances
	Computing systems	Design, manufacturing support, and support services for computer hardware and accessories (Bluetooth peripherals, chipsets, etc.)
Industrial and energy	Industrial, energy, chemicals, and natural resources	Design, development support, and operations support for industrial, energy, chemical production, and natural resources sectors

Source: Everest Group (2016)

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Overview and abbreviated summary of key messages

The ER&D services industry is at an inflexion point and poised for strong growth in the next few years, driven by the evolving customer demand and the changing technology landscape in the industry. Convergence of engineering and technology is creating a new paradigm of ER&D services demand portfolio and enterprises are looking at reimagining product engineering in the changed landscape by accessing talent pool with niche skills and capitalizing on data and analytics to drive value for business.

The report covers the evolving ER&D services industry in terms of the demand trends for ER&D services across major segments, the ER&D global sourcing industry, and the demand trends specifically for the ER&D global sourcing industry.

Some of the findings of the report

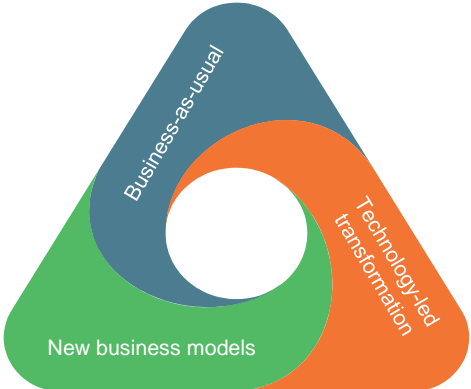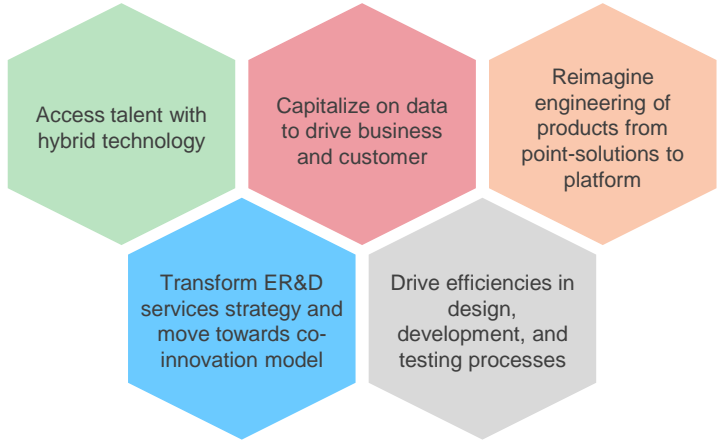|	
Next-generation technologies are catalyst of transformation	• New technologies such as mobile, cloud and Internet of Things (IoT) are fundamentally changing the demand paradigm in the ER&D services industry • Enterprises are focusing on designing products for the connected digital consumer ecosystem build smarter products for the changing consumer demand
Faster speed-to-market for products is critical	• The changing technology landscape and the connected ecosystem demands products that are smarter and designed for the changing customer demand • The changing landscape is increasing time-to-market pressures for enterprises and this is driving the demand for ER&D services
New demand paradigms in the ER&D global sourcing industry	• The ER&D global sourcing industry is showing strong signs of growth and is expected to reach US$ 145-155 billion by 2020 • The strong growth in the market is driven by increasing cost and margin pressures, reducing time-to-market for products, and the need to integrate new technologies with products
Talent strategy driving demand for global sourcing in ER&D	• In the changing landscape, enterprises are looking beyond cost-arbitrage factors for global sourcing and focusing on acquiring the right talent pool for ER&D service delivery • The demand for more agile and flexible products is expected to increase the demand for global sourcing of products

The report covers the changing demand drivers in the ER&D services industry and the ER&D global sourcing market
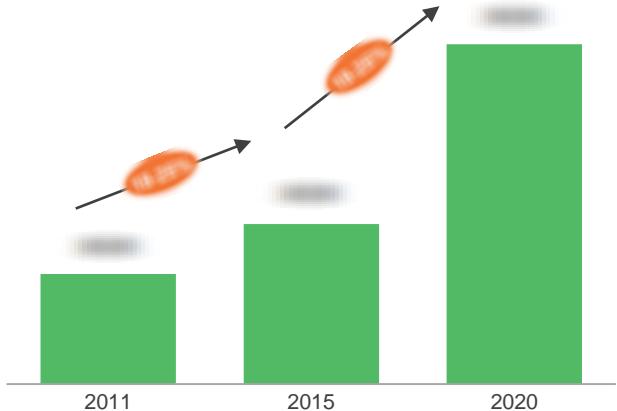
Types of demand for ER&D services

Business-as-usual
Technology-led transformation
New business models

New demand paradigm in the ER&D service industry

Access talent with hybrid technology

Capitalize on data to drive business and customer

Reimagine engineering of products from point-solutions to platform

Transform ER&D services strategy and move towards co-innovation model

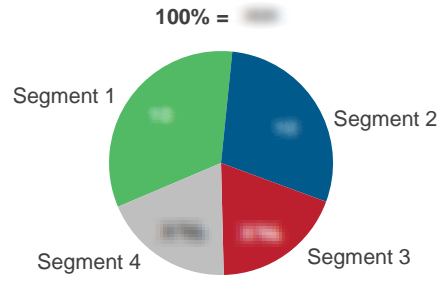Drive efficiencies in design, development, and testing processes

Growth of the ER&D global sourcing industry
2011- 2020E; US$ billions

2011   2015   2020

Size of the ER&D global sourcing industry

ER&D global sourcing industry by segments
2016; US$ billions

100% =

Segment 1
Segment 2
Segment 3
Segment 4

ER&D global sourcing industry by sourcing model
2016; US$ billions

100% =

Model 1
Model 2

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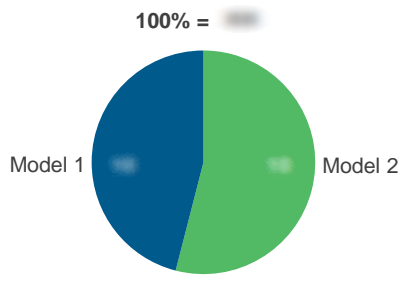
Glossary of key terms used in this report

Term	Definition
AMF	Additive Manufacturing File Format (AMF) is an open standard for describing objects for additive manufacturing processes such as 3D printing
API	Application Programming Interface is a set of functions and procedures that allow the creation of applications which access the features or data of an operating system, application, or other service
CAD/CAM	Computer Aided Design / Computer Aided Manufacturing are the software that help in defining the structure and design of a new product
CAGR	Compounded Annual Growth Rate refers to year-over-year growth rate over a multiple-year period. Formula used : CAGR = (Ending Value/ Beginning value)^(1/number of years)-1
ER&D	Engineering and Research and Development 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
GPS	Global Positioning System is a navigation satellite system that provides geolocation and time information for navigation
IoT	Internet of Things is the internetworking of physical devices, vehicles, buildings and other items through sensors, software, and network connectivity
Lidar	A detection system which works on the principle of radar, but uses light from a laser
RFID	Radio Frequency Identification is the technology that uses electromagnetic fields to automatically identify and track tags attached to objects
SDE	Software Defined Everything

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. **Innovation Beyond Borders – Global Talent Hotspots for Engineering Services and Research & Development (ER&D)** (EGR-2016-2-R-1865); 2016. This report provides an in-depth view of the ER&D global sourcing industry from a talent perspective. It covers the global distribution of ER&D talent and cost competitiveness of leading global sourcing locations providing readers with an up-close view of global talent "hotspots" for various ER&D segments

2. **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:

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About Everest Group

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 empowers 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.

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