Tech Mahindra

Connected World. Connected Solutions.

Integrated Engineering Solutions

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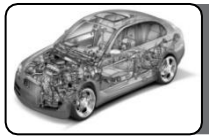
November 2014

Integrated Engineering Solutions: An Introduction

- **Established Engineering Player**
- **Co-Innovator of Technology Solutions**
- **Comprehensive Engineering Ecosystem**
- **Innovative Connected Engineering Solutions**

AUTOMOTIVE



Tie-up with 8 OEMs and 10 Tier-1 majors

AEROSPACE & DEFENSE

Global design centers for 5 of top 8 aircraft manufacturers

HI-TECH / TELECOM

Preferred partner for global ISVs, semicon vendors and OEMs

HEALTHCARE

Affiliation with 3 out of top 5 medical device manufacturers

ENERGY & UTILITIES

Successful pertinence with top 5 global conglomerate

INDUSTRIAL

Strategic association with top 10 Industrial products major

TRANSPORTATION

Long standing relationship with top Rail Transportation Majors

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Market View 2014

Global ER&D Spend

$1.4 Trillion

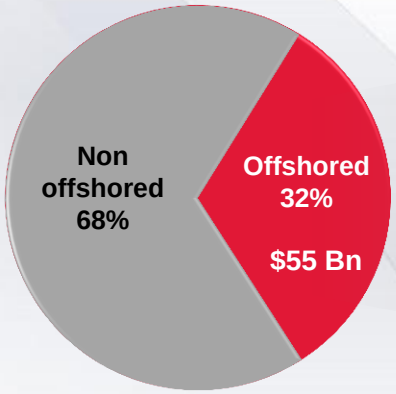
Corporate ER&D Spend

$577 Billion

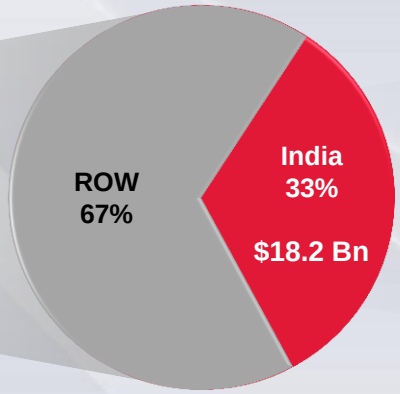
Offshorable ER&D Spend

$170 Billion

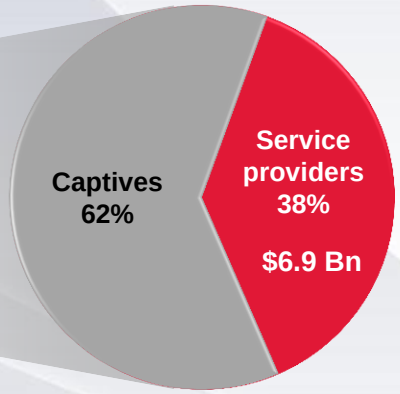
Offshorable ER&D Spend



Offshored ER&D Spend



Service Providers Pie



India's ER&D Globalization and Services Market expected to grow from $18.2 Bn in 2014 to $38 Bn by 2020 (CAGR – 12%)

Source: Zinnov

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Key trends in Global Engineering & RD services

Industry trend	Proof points
Alternate Business models	▪ Carve outs, Solution led selling, out come based business models ▪ Product Sustenance being transferred
Increased embedded content in products and increase of software products	▪ Software product services growing at 17-18% ▪ Embedded and Electronics content increased to 25% - 40% of the R&D spend
Scope of outsourcing is changing fast	▪ Drivers are changing from cost reduction to IP generation and Innovation ▪ Co-develop with customers on products for emerging markets ▪ Aftermarket/Customer Services
Technology, Efficiency, Digitization	▪ Autonomous cars, Drones, UAV, SDN, IOT, Mobility, Cloud at play ▪ Emission and regulatory compliance

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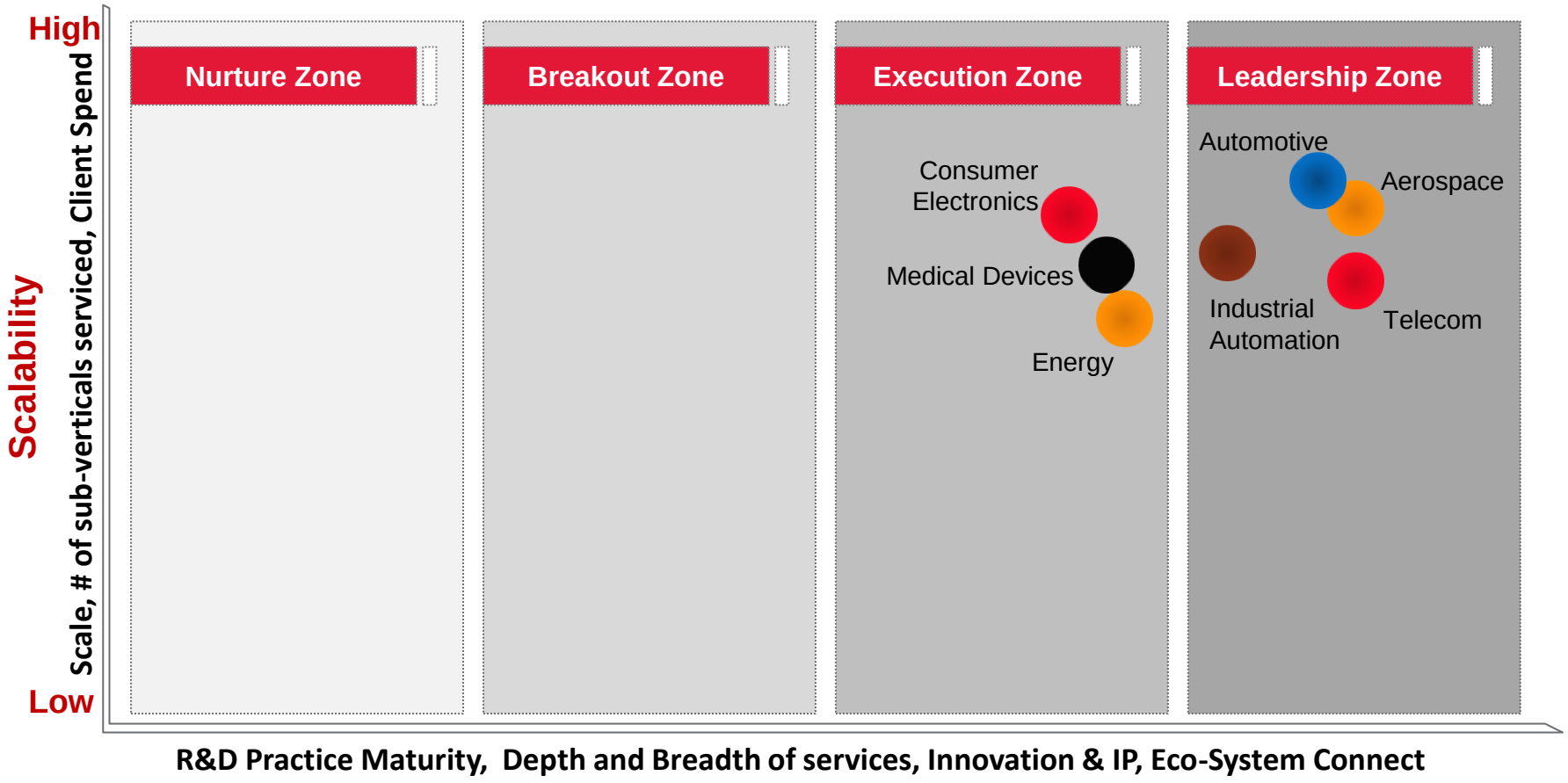
Zinnov Positioning



Leadership Position in Automotive, Aerospace & Defense , Hitech verticals

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Source: Zinnov

MES Integration helping expand automotive footprint

Level of experience

- ○ No experience
- ◐ Experience
- ● Extensive experience

Clients	Asian OEMs	European car OEMs	North American car OEMs	North American CV OEMs
Automotive area				
Interior	●	●	●	●
Exterior	●	◕	●	●
Powertrain/chassis	◕	◔	◐	●
Virtual validation	●	◐	●	●
Embedded systems	◕	◔	◐	◕
Manufacturing engineering	◕	◐	◐	◕
Key components	• Instrument panel, consoles, trims, seating systems • Body and exterior systems • Powertrain peripherals, chassis systems • Vehicle control systems, electric vehicle support • FEA for all systems	• Instrument panel, consoles, trims, seating systems, • Body and exterior systems • Powertrain packaging • FEA-Meshing of large models, structural analysis	• Instrument panel, consoles, trims, seating systems • Body and exterior systems • Powertrain peripherals, chassis systems • FEA-Meshing of large models, structural analysis • Wiring harness, control modules	• All domains and sub-domains

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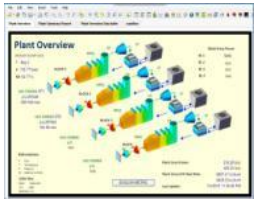
Success Stories

Alternate Business Models

Steam Turbine monitoring and diagnostic program



- Real-Time Remote Monitoring & Diagnostics application for steam turbines in the field
- Integrated with Data center/ network services
- 90% man hours reduced from the manual process

SDN Applications launched in HP App. Store

TechM and HP partnered to launch TechM SDN Applications running on HP VAN Controller

- TechM has launched Smart Flowing Steering and Smart Load Balancer Applications which are publicly available for download on HP App Store
- Multiple other Applications like UCP, HNI are currently being developed

Increased Electronics/Software in products

Digital Health – Test Factory

- Consulting for Test Strategy development for a digital health platform development program.
- Implemented a Scrum based agile methodology for this test driven development program.
- Complete testing ownership for functional & non functional testing like security, performance testing etc..

Development of New Emerging Platform for Infotainment system for an OEM

- Vehicle Integration for the Infotainment product is done by TechM
- Tuner – FM, AM, RDS, Media - USB, Ipod, Aux, CD, IR, BT, Cluster Display
- Robust Integration strategy – Key for multiple releases from distributed teams.
- SOP program support for emerging markets under strict timelines

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Success Stories

IP Generation/Co-Development

Connected Cars – IP development for Japanese Major

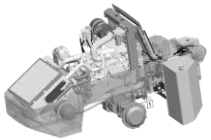
- Automotive : Focus Technology Themes:
- Connected Cars (V2X, Car to Cloud)-X can be vehicle(V), Infrastructure (I), Smartphone
- Autonomous vehicle and advanced driver assistance systems
- Wearable devices in vehicle environment

Design & Development of Airborne Diesel Engine for Unmanned Aircraft (UAV)

- Feasibility studies for adopting automotive diesel engine for Aerospace application in collaboration with Mahindra group company
- 4 Stroke – 4 Cylinder - Turbocharged Diesel Engine
- With Gross power of 170 BHP

Technology, Efficiency, Digitization

Benchmark & Emission Norms compliance for an US CE OEM



- Complete responsibility for vehicle upgrade from Tier III to Tier IV
- Redesign of entire vehicle layout to accommodate - New engine, After treatment devices, cooling module & other related subsystems
- Savings of > USD 12 million over engagement duration

Smart Elevator Platform

- Mobile app allows to place elevator request before even reaching source station. Hence, saves time.
- App uses historical data to suggest frequently visited stations.
- App allows for advanced features like ADA.
- Integrated central analytics to embedded controllers
- Improve the energy efficiency by 20%

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Testimonials

Tech Mahindra partners Alstom for global development centre

PTI Mar 12, 2014, 07.10PM IST

Tags: Vice President | Tech Mahindra | Pierre Gosset | Integrated er | Company Expansion | Business Partnership | Alstom Transport Engir

NEW DELHI: IT services firm Tech Mahindra today said it has set up a global development centre in partnership with Alstom Transport, a manufacturer of rail technology.

Under a three-year partnership, the two companies will focus on the growing need for efficient vertical integration capabilities from engineering to manufacturing on rolling stock interior field.

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Tech Mahindra to establish new Canad Aerospace head office

The new establishment is expected to generate 300 jobs over the next 3 years

aerospace industry in Canada

Skoda India begins putting its house in order

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pashminadevelopers.com

Sudhir Rao, CMD, wants to create an Indian and Czech fusion for product planning.

Paradigm shift in a little over two years since Sudhir Rao took charge at Skoda, there has been a lot of change with the culture evolving towards becoming more customer-

When Skoda entered the Indian market a little over a decade ago, not many people had heard of the company. Yet, it just took a single brand like the Octavia to establish the Czech automaker as the first mover in the premium sedan segment.

After this dream start, a lot was expected from Skoda especially when parent company Volkswagen also decided to set up shop in the country.

The two went in for a common platform strategy at a new facility near Pune which resulted in the rollout of premium hatchbacks (Polo/Fabia) and sedans (Rapid/Vento). On paper, it was the perfect script, except reality was a different ballgame. Today, Skoda is a marginal player in

Fine line

For the moment, Skoda has the Rapid platform to work on and has acknowledged the need to approach it with a "little more Indian/Asian strategy" in investments and costs. It is here that Mahindra Engineering Services has been roped in to help 'Indianise' the overall thought process

The goal now is to find the sweet spot which boils down to "how low compromising on brand character".

It is an interesting initiative in fusion of cultures where the best mix the basis for the future.

This is precisely what Skoda is doing with the Rapid facelift in tander Services. Once things are in place by the year-end, the company will l beyond the Rapid to the small segment.

Premium hatchbacks

According to Rao, premium hatchbacks will gradually become more po

Tech Mahindra wins engineering solutions deal from Bombardier

PTI Sep 4, 2014, 09.01PM IST

Tags: Tech Mahindra | solutions deal | Plane | IT services | Bo

NEW DELHI: IT services firm Tech Mahindra today said it has secured an engineering solutions deal with Canadian aerospace and transportation company Bombardier.

Tech Mahindra to collaborate with Wichita State University in the areas of aerospace engineering, automotive testing

PTI Jul 17, 2014, 12.47PM IST

Tags: Wichita State University | Tech Mahindra | net worth | John Tombli | automotive testing | Aerospace Engineering

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Tech Mahindra partners Texas Instruments

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Tech Mahindra on Thursday said it had partnered Texas Instruments to set up a lab in Bangalore to launch innovative solutions based on the concept of Internet of Things (IoT). This lab will allow Tech Mahindra to launch innovative solutions based on the concept of Internet of Things (IoT) in industrial, medical and automotive sectors, Tech Mahindra said in a statement.

IoT is an evolving space as billions of devices are being connected on the go and consumers are looking for intelligence from connected devices, equipment and infrastructure. — PTI

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Tech Mahindra working on driverless cars and drones

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S RONENDRA SINGH

New Delhi, April 8: Its not just US information technology companies such as Google working on driverless cars and drones, home-grown tech company Tech Mahindra is also working on similar projects as part of its machine-to-machine offering.

For example, the company is working with some major international car companies on using big data analytics to understand driver behaviour.

Karthikeyan Natarajan, Global Head – Integrated Engineering Services, Tech Mahindra, told *Business Line* that auto companies are looking at a digital cockpit that will remove the rear view mirrors by replacing them with cameras that will stitch the images.

Fuel efficiency

"It will also lead to increased fuel efficiency," he said declining to disclose the names of the companies.

The plan also includes features such as self-parking and driverless cars, which may come in next three years, Natarajan said, adding that such business will be the fastest growing (30-40 per cent) in next 5-7

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Thank you.

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