BUILD & DRIVE
THE FUTURE
OF CONNECTED
NETWORK & DEVICES
MAXIMIZING OFFERINGS AND
OPPORTUNITIES FOR THE TELECOM SECTOR
The telecom industry no longer operates independently. In the age of digital transformation, the developments in both telecom and technology are intertwined with each other. The advent of artificial intelligence, augmented and virtual reality, blockchain, smart cities and the internet of things has created a ripple effect in the telecom industry, which is moving in the direction of predictive maintenance, process automation, virtual assistants, and increased security. The demand for “what’s next” has increased exponentially and is constantly evolving. Consequently, the pressure on telcos to innovate and meet the burgeoning demands of consumers has increased multifold.

**What’s Defining the Future of Telecom?**

**5G**
5G will account for 15% of global mobile connections by 2025 according to GSMA. The world’s move towards an era of intelligent connectivity will open immense opportunities for telcos.

**Customer Experience (CX)**
The market for customer experience management is expected to be worth $18 billion by the end of 2023, Market Research Future predicts. Better CX must top the priority list for telcos if they want to emerge as market leaders, as it cuts costs and is the principal differentiator in the industry.

**Blockchain**
IDC forecasts that the global spending total on blockchain will exceed $12.4 billion by 2022. The massive numbers on the willingness to spend is a sign for telcos to hop onto the blockchain wagon.

**Smart Cities**
Grand View Research, Inc reports that the global market size of smart cities is expected to cross $237 billion by 2025, at a CAGR of 18.9% from 2019 to 2025. Aiding the race to develop a smart city economy will be the telecom industry.

**Field Service Management**
A Mordor Intelligence report estimates the market value for FSM to cross $6 billion by 2024. As the role of field service technicians in the telecom industry expand, telcos will need to be adequately prepared.

**Digital Transformation**
The digital transformation market is projected to grow to $665 billion by 2023, according to Research and Markets. Digital transformation will compel telcos to revamp their digital communication strategies to stay on top of the game.
The rapid pace at which the future of telecommunications is developing is creating several challenges. First, the demand for data is continuously increasing—necessitating a need for high-speed and low-latency connectivity. Second, the race to establish 5G has given birth to stiff competition, with both tech and telecom companies clamoring to come out first. Third, the challenge of increasing capital expenditures looms large, as 5G and dependent technologies require significant investment in infrastructure to ensure proper deployment of 5G.

Tech Mahindra, with over a decade of experience in the telecom space, offers solutions to these challenges with its vast capabilities. The company’s investments in state-of-the-art 5G labs across the globe and strategic partnerships have rendered it an industry leader. With a substantial number of man-hours of field testing and lab testing expertise, Tech Mahindra is making huge strides in the telecom waters to enable its partners to stay ahead of the competition.

**PRODUCT ENGINEERING**
- Devices, customer-provided equipment and applications for network infrastructure
- Hardware design and testing
- Wireless and network services
- Cloud engineering

**DIGITAL ENGINEERING**
- Android SW Development
- Carrier Customization
- Post Launch Support – OS/MR/SMR
- Carrier/AVL Testing & Certification
- Field Testing/IoT Test Support
- Friendly User Trial
To move shoulder to shoulder with the fast pace of technological advancements, companies must be willing to innovate and experiment. Strong product engineering aids in diminishing the risk associated with high-stake decisions and abates the time taken for the technological shift with its best-in-class features and functionalities.

With more than 15 years of experience in product engineering services under the belt, Tech Mahindra boasts of 20,000+ man-years in its offering. State-of-the-art labs, facilities, and processes help

Tech Mahindra meet the ever-changing demands in a dynamic market and stay on top of the game. Furthermore, strategic partnerships enable quick adoption to new technologies and early access to different software and development tools.

Having worked with both major and emerging telecom equipment manufacturers and independent software vendors, Tech Mahindra is equipped with deep domain knowledge and a variety of reusable IPs in their arsenal—making Tech Mahindra the engineering partner of choice.

**PRODUCT ENGINEERING CAPABILITIES FROM TECH MAHINDRA**

- Devices, CPEs, access, core, and transport networks, and applications covering entire network infrastructure
- Technology horizontals including virtualization, management applications, hardware design and testing, and agile/CI/CD across an array of verticals
- Wireless and network services
- Switching and signaling
- Cloud engineering, CBRS, vCPE and uCPE

**The Tech M Advantage:**

**FIELD TESTING EXPERIENCE ACROSS GEOGRAPHIES**

**FULL CONTROL OVER TESTING WITH REAL-TIME MONITORING AND REPORTING**
The world is going digital, and there is simply no stopping it. Technology has caused widespread disruption across industries, forcing companies to rethink and rebuild their strategies to prepare for a digital future. In order to safeguard a company’s interests and ensure profitability in the long term, steps must be taken to shape their workflow and output for a strong digital future.

Tech Mahindra—a Forbes’ “World’s Top 15 Digital Shapers” offers end-to-end services across the lifecycle of a device, beginning with product conceptualization to market launch support. Tech Mahindra has made investments exceeding $90 million in Certification and Conformance Labs for big players such as Tier-1 Carriers in the United States. These labs have been accredited for carrier acceptance and conformance testing for OEMs and chipset vendors.

**TECH MAHINDRA’S DEVICE SERVICE PORTFOLIO**

- **Design**
- **Development**
- **Engineering**
- **Testing**
  - Field testing
  - Conformance and Pre-Conformance testing
- **Test consultancy**
- **Certification**
  - Carrier certification
  - GCF and PTCRB certification

**THE TECH M ADVANTAGE**

The Tech Testing labs for mobile devices

- **Fremont, USA**
- **Redmond, USA**
  Carrier Acceptance and Conformance (Tier-1 Carriers), MVNO Certification Lab
- **New Jersey, USA**
  Carrier Acceptance & Conformance Lab (CCF, PTCRB, CTIA, A2LA)
- **Toronto, Canada**
  Operator Acceptance & Conformance Lab (Live network tests)
- **Bengaluru, India**
  Carrier Pre-Cert Lab
- **Noida, India**
  Carrier Acceptance & Conformance Lab (GCF, NABL, OTA and Tier-1 Carriers in the United States)
As the world progresses towards 5G, organizations need to cater to changing consumer demands and unprecedented competition. Tech Mahindra’s significant strides in this domain, with well-equipped 5G labs and investments for 5G solutions, provide businesses with bespoke solutions for their future investments. It is already dealing with different 5G engineering projects for major OEMs and T&M equipment providers. Moreover, the company’s 5G Academy ensures that its resources receive proper training and have a hands-on experience with all aspects of 5G. Tech Mahindra’s 5G portfolio and capabilities make it a forerunner for becoming a 5G engineering services partner across devices, base stations, packet cores, and end-to-end solutions. Tech Mahindra is also the proud owner of the world’s first 5G GCF/PTCRB-ready lab.

**Tech Mahindra’s 5G Capabilities**

- Active participation in 5G standardization, especially on NAS/RRC
- 5G product development
- 5G subsystem development and validation
- 5G test and measurement tool solutions

**The Tech M Bonus**

**Lab Coverage for Network Communications**

<table>
<thead>
<tr>
<th>Test Sections</th>
<th>Coverage %</th>
<th>Lab Location</th>
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<tbody>
<tr>
<td>DDR 10776</td>
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<td>Stock</td>
<td>100%</td>
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<tr>
<td>Non-stock</td>
<td>100%</td>
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<td>2G Protocol</td>
<td>100%</td>
<td>Noida, India</td>
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<td>3G, LTE Protocol</td>
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<td>New Jersey, USA</td>
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<td>2G RF</td>
<td>100%</td>
<td>Through Partner labs</td>
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<td>2G, 3G, LTE – Protocol, RF/RRM</td>
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<td>Upcoming lab, Fremont, USA</td>
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WHY TECH MAHINDRA?

TECH MAHINDRA COMES WITH STRONG CREDENTIALS IN TELECOM

INTERNATIONAL MEMBERSHIPS

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DEVICE TESTING CERTIFICATIONS

- GCF certification
- PTCRB certification
- CCF – CDMA certification
- Carrier certification

SERVICE PORTFOLIO

- Android bring-up
- Carrier customization, including customization of Tier-1 Carrier handsets and of other leading carriers.
- Security patch/OS upgrades
- New device launch
- Testing and certification

- 15+ years’ experience in wireless product testing and certification globally
- World’s fastest-growing test lab across 2G, 3G, 4G, and 5G technologies
- 1500+ Device Development and Test Engineers worldwide
- 1,00,000+ man-hours of field-testing expertise
- 2,00,000+ man-hours of lab testing expertise
- 100+ phones, tablets and module manufacturers

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### TECH MAHINDRA DEVICE ENGINEERING SERVICE PORTFOLIO

#### TIER-1 CARRIERS IN THE UNITED STATES

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<th>HARDWARE</th>
<th>SOFTWARE</th>
<th>CERTIFICATION</th>
<th>OTHER SERVICES</th>
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<td>Device Specification Definition</td>
<td>Systems Engineering and SW Architecture</td>
<td>Regulatory &amp; Conformance Testing</td>
<td>Quality Process Def (Plan)</td>
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<td>HW ID Design</td>
<td>Software Development</td>
<td>Carrier Certification</td>
<td>Field Service/Beta Deployment</td>
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<tr>
<td>HW Reliability Verification</td>
<td>Market/Carrier/Custom Feature Development</td>
<td>Third Party Support</td>
<td>Production Inspection (FAI)</td>
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<td>OTA RF Testing</td>
<td>Stability Testing</td>
<td>BT, Wi-Fi, Accessory Testing</td>
<td>Motive IoT Support</td>
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<tr>
<td>System &amp; Performance Testing</td>
<td>Field Testing Resources</td>
<td>IEC Deliverables</td>
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<tr>
<td>Regionalization</td>
<td>Carrier Lab Support</td>
<td>iQi Support</td>
<td></td>
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<tr>
<td>Re-Flashing Software/Logistics</td>
<td>RTC Lab Support</td>
<td>TAM Support</td>
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Tech Mahindra represents the connected world, offering innovative and customer-centric information technology experiences, enabling Enterprises, Associates and the Society to Rise™. We are a USD 4.9 billion company with 121,840+ professionals across 90 countries, helping over 935 global customers including Fortune 500 companies. Our convergent, digital, design experiences, innovation platforms and reusable assets connect across a number of technologies to deliver tangible business value and experiences to our stakeholders. Tech Mahindra is the highest ranked Non-U.S. company in the Forbes Global Digital 100 list (2018) and in the Forbes Fab 50 companies in Asia (2018).

At Tech Mahindra we live the philosophy of connected world and connected solutions. We appreciate that the new revolution is powered by the intelligent symphony of solutions designing ‘experiences’. With the ever growing importance of technologies and platforms only those who can create and sustain world class experiences through them will thrive. Consumer ‘experiences’ are driving and disrupting industries like never before.

Businesses must build seamless and integrated technology capabilities across dimensions – the digital, the physical, the convergent, and everything in between. That’s when connected experiences manifest. And that’s when enterprises and people alike will be empowered to Rise™ in a connected world.

INTEGRATED ENGINEERING SOLUTIONS (IES)
IES IS A CONNECTED ENGINEERING SOLUTIONS BUSINESS UNIT OF TECH MAHINDRA.

At Integrated Engineering Solutions, customers are at the core of every innovation. We align Technology, Businesses and Customers through innovative frameworks. We deliver future-ready digital convergence solutions across Aerospace and Defense, Automotive, Industrial Equipment, Transportation, Consumer Products, Energy and Utilities, Healthcare and Hi-Tech products.

Our “Connected” solutions are designed to be platform agnostic, scalable, flexible, modular and leverage emerging technologies like Networking, Mobility, Analytics, Cloud, Security, Social and Sensors, that enable launching of smart products and deliver unique connected consumer experiences weaving a connected world. Coupled with this, our strong capabilities in Electronics, Mechatronics and Mechanical Engineering along with domain understanding and product knowledge, bring excellence to the entire lifecycle of these connected ecosystems.

To know more on how Tech Mahindra can help your company please contact

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