# CONSUMER ELECTRONICS

## Engineering Smart Products
## for the Connected World

The consumer electronics industry is undergoing a sea change, owing to a series of rapid technological disruptions and the burgeoning consumer demand. It is now crucial for the personal devices and home appliances to have scalable application, flawless connectivity, robust security, and seamless integration with the larger ecosystem. A steady rise in the application of technologies, such as augmented and virtual reality, automation, and IoT, has pushed the OEMs to do a complete product overhaul, both from a hardware and software perspective, to stay relevant and competitive. In the context of enterprise devices, OEMs are facing challenges related to power management, ruggedization, ergonomic form factors, and containment of production costs.

With nearly two decades of experience across devices, platforms and solutions, L&T Technology Services offers turnkey product engineering services right from design to mass production. Our experts come with a deep understanding of the consumer and enterprise product market and the trends that shape consumer behavior.

# WHAT WE OFFER

## Product Development

- Product Development, Enhancement, and Customization
- Android Platform Bring-up and Stabilization
- Operator Customization
- Android OS Upgrades & Security Patch Upgrades
- Modem Customization
- Platform Stabilization
- Power Management and Optimization
- Product Ruggedization

## Customer Experience Engineering

- UI/UX Design and Development
- Android/iOS Application Development
- Web Application Development
- Live Streaming
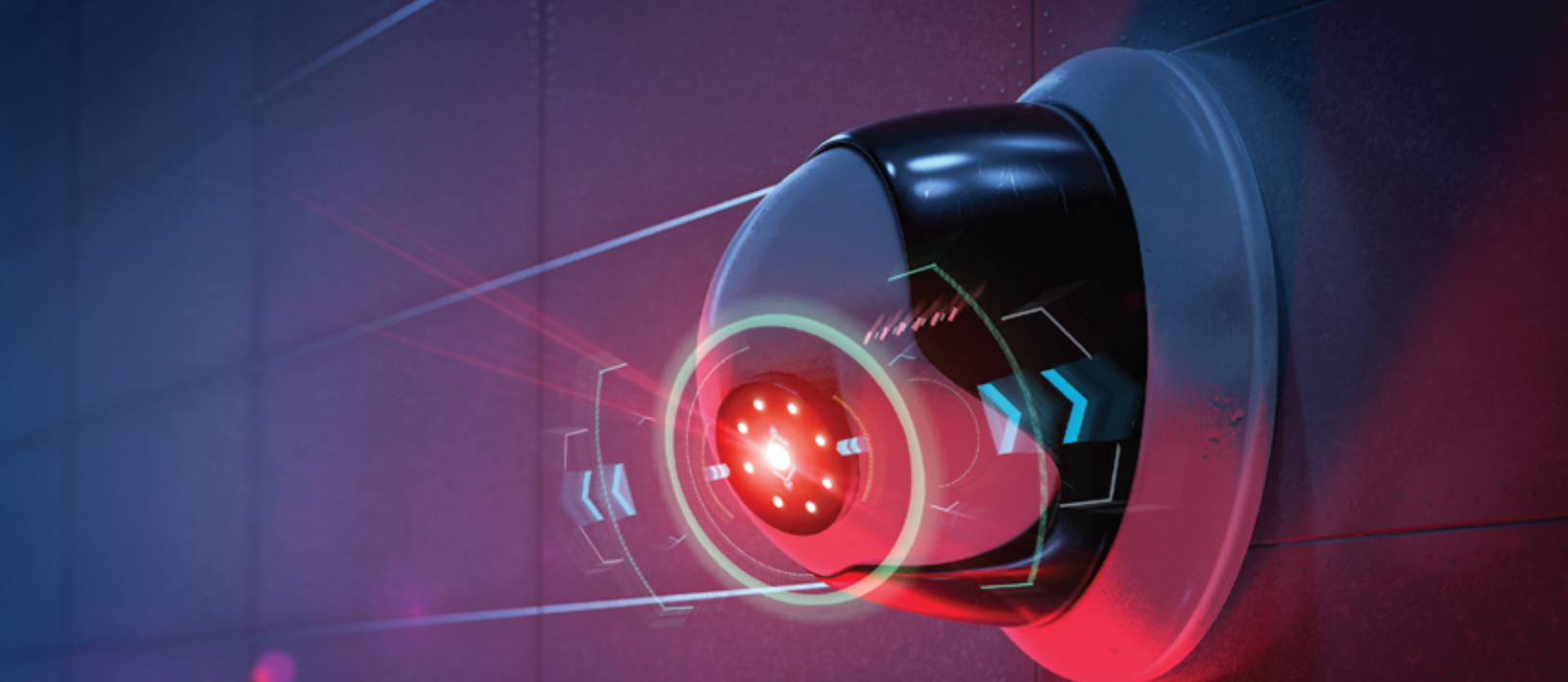- Country Customization/Localization

## Mobility Enablement

- Cloud Services
- IoT Device Integration
- Customized Enterprise Applications
- AllJoyn Compliance
- DevOps
- Bluetooth and Wi-Fi Enablement
- Analytics
- Security Features Enhancement

## Testing & Certification

- System Testing
- Field Testing
- Interoperability Testing
- Factory Test Support
- Log Analysis Support
- Test Strategy Development
- GCF and PTCRB Certification
- CTS/GTS Verification
- Operator Certification
- Device Health Diagnostics, Security, and Vulnerability Testing

# SEGMENTS WE COVER

### PERSONAL DEVICES

- Mobile Devices
- Smartphones
- Consumer Wearables
- A/V Devices
- OTT
- Camera
- Gaming Consoles
- Accessories

### ENTERPRISE DEVICES

- Hand-held Computers
- Ruggedized Tablets
- Handheld Scanners
- POS Terminals
- Security Enablement
- Surveillance Camera & Video Analytics
- VMS

### CONSUMER IoT & RETAIL

- Residential Gateways
- Smart Assistants
- Thermostats
- Surveillance Devices
- Security Solutions

# THE POSSIBILITIES WE CREATE

- **Smart overhaul to legacy products** that revitalizes business and helps OEMs stay relevant.
- **Interoperability & platform porting** that facilitate integration of consumer electronic devices with smart home ecosystems.
- **Multifold security** on chip, device, and enterprise/home levels.
- **Carrier customization** that enables device adoptability and performance enhancement.
- **Value engineering and optimization** that enable OEMs to build products at their target price point.
- **Connected workers** who are empowered to work faster and smarter.
- **Delighted customers** who enjoy personalized experiences powered by technologies, such as augmented and virtual reality.

# WHAT MAKES US **DIFFERENT**

**400+** Man-years of android expertise

Turnkey product design & engineering of **50+** enterprise devices

In-depth device customization and modem & certification expertise

Capability to develop futuristic and robust IoT solutions for multiple industries

Test lab & certification house partnerships (TEOCO, SGS)

Customization experience for 20+ operators worldwide

In-house analytics team

Manufacturing house partnerships for prototyping and mass production

Robust security system - Secured VoIP, VOLTE & IMS for the deployment of enterprise and public safety devices

An extensive power electronics development facility (development of low power RF designs and high power density electronics)

# SUCCESS STORIES

**World's 1st Dual Touchscreen Android Smartphone**
- 100% increase in battery life with the use of secondary display
- Facilitated entry into new markets, such as Russia, US, Europe, China, and India
- Best of CES 2015 Award and Critics Choice Award in NYT

**Body Camera for Public Safety Personnel**
- Complete onsite-offshore factory support throughout product development lifecycle
- Application customization for automatic recording, based on emergency button press/release and Bluetooth sensors
- Smart holster support and hall effect sensor for face-in/face-out carry detection

**Smart Welding Using Wearable Technology**
- Study mode operation to understand the welder pattern
- Graph and pipe UI to show real time welding positions
- Prototype report for manual welding

**Ripple Support App: World's First Wearable Support Network**
- Helped the customer attain market leadership in the wearable support segment
- Customized application software to suit the requirements of the wearable's OEM
- Integrated application with the wearable device and central server to raise alerts and request service for assistance

# ENGINEERING NEXT GENERATION VISUAL INTERACTIONS

**AUGMENTED REALITY**　　　　**VIRTUAL REALITY**　　　　**MIXED REALITY**

## Platforms

- Magic Leap
- SmartEyeglass
- Windows Mixed Reality

## Technology Competencies

- AWS, Azure Cloud, and Enterprise Integration
- 3DMax, Unity 3D, Vuforia Tools
- 2D, 3D Rendering Using OpenGL
- Visual Studio, Windows 10

## Devices

- Smart Phone, Tablets & Wearables
- Magic Leap
- Oculus Rift
- PlayStation
- Microsoft HoloLens
- Meta 2
- Google Glass
- castAR
- SmartEyeglass Developer Edition

## Service & Training Solutions

- Enhanced Service Support
- Faster Turnaround
- Interactive User Guides
- Immersive Training Experience

## Digital Marketing Solutions

- Increased Customer Engagement
- Enriched Feature Presentation
- High Quality Leads & Sales Turnaround
- Scalable Solutions

# SUCCESS STORIES

**AR enabled Product Configurator and Visualizer developed for a heavy electrical equipment manufacturer**

- Enabled virtual customization of the tap changer associated with transformers
- Enabled visualization of the placement of tap changer on transformer using Tablet's camera in actual environment
- Highlighted hotspots on the product and displayed overlay content

**VR Training App for Office Space Safety Hazards developed for one of the largest aircraft manufacturers**

- Creation of virtual office environment with all safety hazards in place
- Enablement of gestures/voice controls
- Immersive training experience in a virtual setting

**Training Solution Using HoloLens**

- Enabled users to virtually visualize and experience the products
- Facilitated an overlay of the details of home appliances, including temperature, cooking status, and expiry of products in the freezer, using augmented reality (AR)
- Enabled 360° rotation of products, offering a view from various angles

**Augmented Reality Application for Heavy Trucks**

- Developed a cross-platform mobile/tablet application to help truck drivers learn dashboard features of the truck
- Enabled integration with google analytics
- Provided multi-lingual support

**Virtual Trainer for Filler Valve Repair**

- Enabled on the fly training for the Operators
- Provided a scalable solution to add more tutorials in the future
- Enabled machine operators to do the job without involvement of maintenance personnel

**Virtual Plant Walk-Through**

- Developed a mobile app to help users familiarize themselves with the plant and manufacturing procedures
- Offered navigation through the 3D environment
- Facilitated user interaction with the equipment to fetch more details about specific parts

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For more information visit us at www.LntTechservices.com        Reach us at info@LntTechservices.com        **L&T Technology Services**

**About L&T Technology Services**

L&T Technology Services Limited is a publicly listed subsidiary of Larsen & Toubro Limited with a focus on the engineering services space, partnering with 52 Fortune 500 companies and 51 of the world's top ER&D companies. A leading pure-play Engineering, Research and Development services company, we offer design and development solutions through the entire product development chain, across various industries such as Industrial Products, Medical Devices, Transportation, Telecom & Hi-tech, and the Process Industry. We also offer solutions in the areas of Mechanical Engineering Services, Embedded Systems & Applications, Engineering Process Services, Product Lifecycle Management, Engineering Analytics, Power Electronics, Machine-to-Machine (M2M), and the Internet-of-Things (IoT).