TECHNOLOGY SERVICES BUSINESS

Mixed Reality and VR technologies create delightful immersive experiences for industries ranging from transportation to smart homes

Overview:

L&T Technology Services Limited (LTTS) is a leading global pure-play Engineering Research & Development (ER&D) services company. It offers design and development solutions throughout the product development chain and provides services and solutions in the areas of mechanical and manufacturing engineering, embedded systems, engineering analytics and plant engineering. LTTS customer base includes over 50 Fortune 500 companies and 51 of the world's top engineering research and development (ER&D) companies, across industrial products, transportation, telecom & hi-tech, medical devices and the process industries. The business also provides digital engineering advisory services to some of the world's leading establishments. The key differentiators for the business are its customer-centric industry innovations, domain expertise and multi-vertical presence spanning major industry segments.

Transportation

LTTS offers the complete gamut of engineering services and solutions for its global customers in the transportation industry, including OEMs and Tier 1 suppliers in the automotive, trucks & off-highway vehicles and aerospace sectors. In the automotive sector, LTTS helps its customers through advanced technologies such as autonomous driving and electric vehicles. In the aerospace sector, LTTS's services cover aerostructures, aero systems, aero engines and avionics. Its digital offerings in this segment span in-flight entertainment and connectivity, air traffic management and drone-based solutions. LTTS also has over a decade of domain expertise in enabling leading brands in the trucks and off-highway segment. LTTS caters to customer requirements through specialized state-of-the-art research and test labs for power electronics, tear down and smart manufacturing across its global delivery centres.

Industrial Products

Through its extensive expertise in industrial products, LTTS helps its OEM customers across building automation, home and office products, energy, process control and machinery. LTTS home-grown building management solution, iBEMS, breaks the silos between various systems in a facility and enables cost savings, energy management and quicker decision- making by using predictive analytics and real-time insights. LTTS Industrial Products segment facilitates end-to-end product development guidance, deep domain expertise across software, electronics, connectivity, mechanical engineering, industrial networking protocols, User Interface/User Experience (UI/UX), test frameworks and enterprise control solutions.

LTTS' Healthcare practice helps OEMs develop sophisticated medical devices at affordable costs

LTTS helps automotive firms harness the power of advanced telematics, intersecting security, implementation ROIs, and end-user satisfaction

Telecom and Hi-tech

LTTS has vast experience in product development, digitalisation, user experience engineering and testing & certification. LTTS offers its customers a one stop-solution covering the gamut of services in product variant development, 5G capabilities, simulation & automation, and product and midlife support. LTTS Narrow Band IoT (nBIoT) solution, 'nBon', was developed with low memory and low power footprint. It provides thorough IoT device management, enabling easy integration with custom target platforms.

Process Industry

LTTS provides its services in E/EPCM (Engineering, Procurement and Construction Management), Engineering Reapplication and Global Rollouts, Plant Sustenance and Management, Regulatory Compliance Engineering along with chemical, consumer packaged goods (FMCG) and energy and utility sector clients. LTTS W.A.G.E.S. (water, air, gas, electricity, and steam) management solution, integrated with sensors and smart meters, implements a Supervisory Control and Data Acquisition (SCADA) system. LTTS has broad expertise in traditional EPCM and operational maintenance projects, as well as contemporary digital engineering enterprises. LTTS is furthering its engineering footprint to include the digital sphere, and is working with its customers across the globe on 'Smart Manufacturing' technologies such as automation, IoT, analytics and augmented reality (AR).

Medical Devices

LTTS helps medical device OEMs address industry challenges, accelerate time-to-market and optimize costs, leveraging its deep domain expertise and best-in-class technological capabilities. It focuses on delivering solutions in diagnostics, patient mobility services, musculoskeletal services, life sciences, surgical services, cardiovascular, home healthcare and general medical. LTTS has designed and developed innovative products and solutions such as the world's first drug patch applicator, smart inhalers, connected hospitals, integrated reusable vessel sealing and surgical staplers for emerging markets, along with the world's first airway clearance system with Bluetooth connectivity, among others.

Business Environment

According to NASSCOM, by FY2022, the global ER&D spend will be on an upward trajectory and reach USD 2 trillion. Indian ER&D exports are projected to leap from USD 28 billion in FY2019 to USD 42 billion in 2022 – a CAGR of 14%. Within ER&D, the share of digital engineering is likely to increase significantly. Zinnov estimates that corporations spent USD 293 billion in 2018 on digital engineering, which will grow to USD 667 billion by 2023.

Headquartered at Knowledge City, Vadodara, L&T Technology Services helps clients gain the competitive edge by building smart products, enabling smart manufacturing and offering smart services.

Increased industry focus on emerging technologies viz. Artificial Intelligence (AI), Internet of Things (IoT), Machine to Machine (M2M) communication, Augmented Reality (AR) / Virtual Reality (VR), 5G, Cyber Security, Advanced Robotics, Mobile Applications and Blockchain are finding use-cases across verticals. This increased digital affinity from the enterprises worldwide has resulted in business models shifting to platforms, data monetization and go-to-market strategies that stand out.

Transportation: Autonomous vehicles, electric cars, connected cars, ADAS, Factory 4.0 are some major trends shaping the automotive industry. Predictive maintenance, shop-floor automation, in-flight connectivity and digital twins are driving growth in aerospace and defence. The trucks and off-highway segment is benefitting from the growing demand in construction, logistics, agriculture and mining sectors.

Industrial Products: Major trends in this segment are related to Industry 4.0 such as smart manufacturing, robotics, artificial intelligence and the Internet of Things (IoT). Significant investments are being made in product simulation, predictive asset management, factory & plant automation, cloud computing, smart sensors and 3D printing.

Telecom & Hi-Tech: In Telecom, 5G, virtualization of functions as well as robotic process automation are the primary trends. Customer engagement and monetization have become more effective, leveraging AI, ML and data analytics. The consumer electronics segment has experienced faster time-to-market driven by connected and smart devices, data monetization and open source systems. The semiconductor space is being driven by connected chips and integrated API platforms while in media and entertainment, OTT platforms & services, AI / ML- based content recommendations and targeted advertising are the major trends.

Process Industry: The need to ascertain cost-optimization in plants is a major element that is driving the expansion of asset management in manufacturing. The need to ensure prevention of potential asset failures and precautionary measures is expected to motivate the development of this market. Moreover, plant digitalisation and cloud-based asset management are enhancing overall safety, productivity and compliance.

Medical Devices: This segment is expected to be driven by preventive healthcare leveraging increasing adoption of technologically advanced smart wearables and real-time monitoring. The rising need for early diagnosis and prevention of diseases and compliance to stricter regulatory environments are key priorities for medical devices OEMs.

Industrial Digitalization creates enormous opportunities for companies to increase customer value through streamlining processes

Predictive analytics solutions foster real time machinery condition monitoring for manufacturers

Major Achievements

Transportation

- Secured multimillion-dollar deals, with two leading automotive manufacturers, in the space of HIL simulation and autonomous validation and infotainment assessment respectively
- Deployed several cutting-edge technologies for PMA (Part Manufacturing Approval), digital innovation and recognition for aircrafts, advanced rail signalling design and RAMS and special purpose text fixture design
- Implemented several of its homegrown offerings in transportation domain such as its cognitive AI framework AiKno™ in MRO and after-market activities, its application solution for shop floor material tracking and asset management and its flight infotainment services and response improvement solution

Industrial Products

- Won a major deal with the world's leading software company for 'smart building' consultancy
- Signed a multi-year contract to provide digital content management services for a reputed technology company's industrial products segment
- Won a landmark project to be the ER&D partner for a US Industrial Automation major and a large deal in smart manufacturing for a leading automotive major in the US.
- Facilitated major innovations for the electrical vehicles market such as a high-efficiency DC to DC convertor and on-board charger and environmental cleaning solutions for the marine industry to facilitate emission reduction
- Helped various global customers in mining and discrete manufacturing with machine automation

Telecom and Hi-tech

- Awarded a network deployment automation project by a leading telecom customer
- Setup a 5G lab for designing and building future ready solutions for a leading semi-conductor company in the US
- Involved in the development of the new-age smartphones capabilities for two top-tier OEMs
- Developed a next-gen digital signage solution called FlyBoard
- Created an in-house OTT solution framework

Design Thinking Studio at LTTS' Bangalore campus

- Developed Iron Home, a next-gen smart home security platform

Process Industry

- Won a multimillion-dollar digitalisation project from ExxonMobil in April 2018
- Signed a high-value deal with a multi-national chemical company for a digital engineering project, which is one of the largest in this domain
- Won a large deal with one of the biggest tyre manufacturers
- Expanded footprint in Europe with two large deals – one involving development of high-end capabilities for a customer in the beverage and brewery industry and another deal to execute an EPCM order for a greenfield project with a German chemical major
- Currently executing a multi-year deal with Covestro to implement digitalisation-based engineering programmes across their 8 global locations
- Delivered customised digital solutions for a brewery major in North America for the first time and executed 6 pilot projects that are currently being scaled-up globally

Medical Devices

- Expanded footprint in Japan by signing large deals with 4 customers in medical devices, electromedical equipment and medical kit products
- Secured a deal with a global pharmaceutical company for developing a mobile platform for diabetic therapy
- Assisted a leading medical equipment manufacturer by enhancing the reliability of their slide-maker strainer equipment
- Partnered with a leading in-vitro diagnostics company to launch an efficient automated blood cell counter for price-sensitive, small and medium sized labs
- Developed a cybersecurity framework for medical devices to complement its solutions for Internet of Medical Things to facilitate secured connectivity and monitoring of medical devices

Significant Initiatives

The business aspires to continue being a global leader in the ER&D segment. LTTS has undertaken several significant initiatives to achieve this objective. These initiatives include:

IP and Solutioning

To capitalize on the disruptions and current digitalisation wave, the business is investing in building new age

Solar connectivity drone capable of maintaining a continuous flying time of 12 months enables low cost mass connectivity to rural areas

solutions and technology platforms. In FY19, LTTS was able to scale-up its portfolio of platforms and solutions, as well as incubate new ones to address requirements in emerging areas.

There was a significant jump in the number of pilots and POCs that were done by LTTS around these platforms for customers. Some interesting and challenging assignments executed include:

- Sensorising and connecting oil tanks of an oil major to monitor oil level in tanks. Sensorisation and connectivity are two big challenges and LTTS established this framework using its own IOT platform.
- Working with a leading data-centre services provider to implement predictive maintenance solutions that ensure uptime of the utilities infrastructure.
- Partnering for a complete NB IOT Modem SoC with a company building solutions for utilities and energy industry. This meant an integration of LTTS NB IOT IP with the partner's RF IP.

Mergers and Acquisitions

LTTS acquired Bengaluru-based Graphene Semiconductors to strengthen its offshore presence and deepen its expertise in VLSI chip design and embedded software. Graphene complements the strategic acquisition of US-based Esencia Technologies in 2017 and will act as a force multiplier to enhance the business's capabilities in the semiconductor and product OEM space.

Expanding International Presence

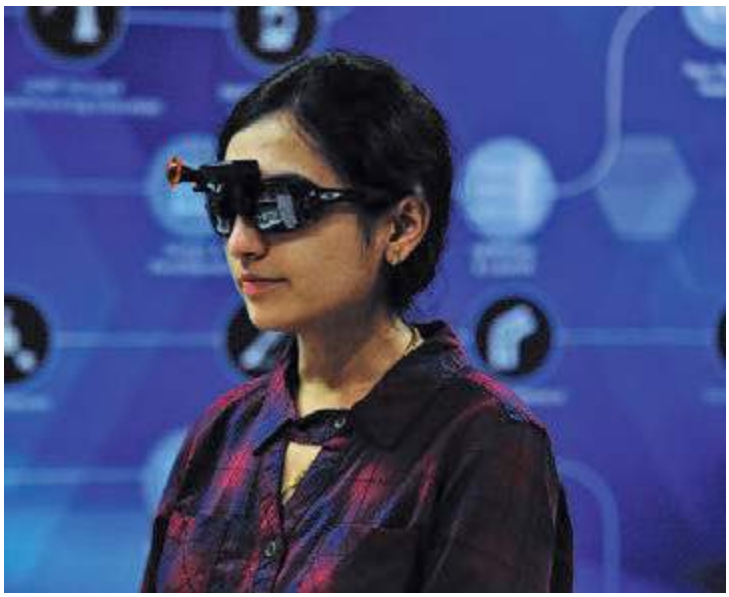
The business has established design centres and centres of excellences across the globe. It has inaugurated its Digital Engineering Centre in Gothenburg, Sweden. Located in the Lindholm Science Park, the Centre will act as a near-shore development facility for customers in the region, providing proximity and support to their agile transformation initiatives. The business has also opened branches in Malaysia and South Africa and has initiated processes to establish a presence in China and Saudi Arabia in the next financial year.

Awards and Recognitions

Several global customers, reputed industry forums, global consultancies and media publications recognised the business in the highest echelons of engineering services innovators for its innovative products and solutions.

Organisational Awards

- Recognized as the 'Best Company of the Year', and was also conferred the prestigious 'Excellence in Corporate Social Responsibility' award by the Indo-American Chamber of Commerce (IACC)



An engineer wearing a mixed reality headset that helps solve contemporary business problems

LTTS has patented multi-voltage booster technology for a welding power source

- Awarded the HR Department of the Year distinction 2018 at the Delaware Valley Awards by the Rosen Group

Technology Awards

- The AiKno™ framework was selected as one of the Top 50 use cases in the NASSCOM Artificial Intelligence Game Changer Awards 2018
- Honoured with the 2018 IoT Platforms Leadership Award by IoT Evolution , a US-based technology publication, for their IoT-powered Condition-Based Monitoring Solution 'Integrated MCare' powered by the Company's IoT platform UBIQWeise2.0™

Research and Analysts Awards

- Positioned in the 'Leadership Zone' in the broadcasting vertical of the Zinnov Zones 2018 Media & Entertainment Services Report
- Recognized as a 'Leader' for Embedded System Engineering Services and positioned among the top 3 leading companies by the Everest Group
- Rated as a Leader in 6 market categories across 3 industries in the US market in the inaugural edition of ISG Provider Lens™
- Acknowledged as a Leader in IoT Technology & Services by Zinnov across 12 unique expertise areas as compared to 7 in 2017

Environment, Health and Safety

At LTTS, it is a constant endeavour to extend sustainable and eco-friendly processes, services and solutions that contribute to sustainability throughout their life cycle. Facilities created within the premises have adequate green spaces and tree cover.

LTTS constantly works on health, safety and providing an environment conducive to well-being. Since many of the employees work at client locations in factories for deployment of projects, they have been trained on 'Zero Harm' to ensure their safety and foster continuous improvement.

Human Resources

The Company's HR policies have strongly focussed on creating a culture of excellence and achievement. Abiding by the People, Process and Portals parameters, the business is striving towards making the employees at all levels an integral part of the decision-making system. There has been an enhancement of skills, efforts and achievements and employee satisfaction levels through various initiatives like:

- **WIZneers**, an internal platform to create a community of technology architects within the Company. Under this initiative, employees come together every fortnight to discuss and ideate on next-gen technology trends in the engineering services space like Blockchain, Artificial Intelligence and Machine Vision among others

Providing insights into products and equipment health through Augmented Reality

- **Just Code**, a hackathon, aimed at offering employees an opportunity to plunge into an idea and convert it into a product
- **Illuminate**, a programme which aims to leverage internal talent and create a pool of high potentials who can be moved across functions and to groom high potential candidates to take up higher roles and responsibilities
- **LEAD**, a programme designed to help senior employees start their development journey as leaders
- **ALP (Accelerating Leadership Potential)**, an initiative for refining the leadership skills of leaders have already acquired, and for developing those essential for the greater responsibilities ahead

Risks and Concerns

Economic slowdown in key geographies or cyclical downturns in key segments could materially affect the revenue growth and profitability. Changing immigration laws and policies can impact the Company's ability to provide services to customers. Exchange rate fluctuations could materially impact the results of operations.

Outlook

An interplay of digital and ER&D with increased industry focus on emerging technologies including Artificial Intelligence (AI), Internet of Things (IoT), Machine to Machine (M2M) communication, Augmented Reality (AR) / Virtual Reality (VR), 5G, Cyber Security, Advanced Robotics, Mobile Applications and Blockchain are finding use-cases across verticals and are enabling companies to discover new revenue streams, while strengthening existing ones and serving the customers with much higher operational efficiency.

Essentially, the growth in the ER&D ecosystem will be driven by a convergence of emerging technologies and business model innovations, along with the growth of technology enterprises and start-ups constituting a dynamic global engineering ecosystem. This will be in an environment replete with strict data protection directives, increasing instances of cyber terrorism and the rising need for cloud-based cybersecurity solutions among enterprises.

LTTS aspires towards industry-leading, innovation-led profitable growth.