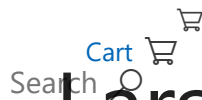**Microsoft**
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Larsen & Toubro Construction unlocks business value with a connected equipment platform powered by Microsoft Azure IoT and AI

L&T Construction

Customer
Larsen & Toubro (L&T) Construction

Products and Services
Azure IoT Hub
Azure SQL Database Managed Instance
Machine Learning Services (AI)
Power BI

Industry
Manufacturing

Organization Size
Not Available

Country
India

January 20, 2020

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Just boarded a flight from a major Indian airport? Most likely, the complete airport infrastructure was built by Larsen & Toubro (L&T) Construction (https://www.lntecc.com/) . An integral part of L&T Group, L&T Construction is a USD21 billion technology, engineering, and construction conglomerate.

Microsoft
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Driving down a national highway in India or taking a metro ride for a quick commute? It's quite likely that these are successfully executed projects by L&T Construction. The Statue of Unity, the world's tallest statue, was built in record time under challenging circumstances by L&T Construction.

Ranked among the top 15 global contractors by Engineering News Review (https://www.lntecc.com/homepage/common/corpawards.html) , L&T Construction is India's largest construction company. It designs and builds some of the largest construction projects across the globe, spanning airports, residential buildings, factories, highways, railways, metros, special bridges, dams, infrastructure for power transmission & distribution, renewable energy plants, water and effluent treatment plants, and smart cities.

L&T Construction is among the pioneers spearheading digital transformation in the global construction industry through "Digital @ Construction," a program that focuses on accelerating project progress, enhancing operational efficiencies, and enabling data-driven decision making. As a part of this transformation program, L&T Construction has developed and deployed cutting-edge digital solutions and platforms across the construction value chain.

One such key platform that is deployed at scale is Asset Insight, a connected equipment platform that takes advantage of Microsoft Azure IoT and AI.
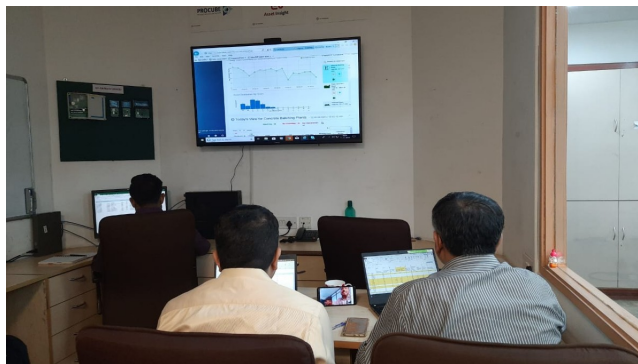
Equipment fleet of L&T Construction

L&T Construction owns, operates, and maintains more than 35,000 pieces of equipment at over 450 project sites spread across the globe. This constitutes a variety of equipment, like tower cranes, concrete batching plants, motor graders, pavers, weighbridges, power generators, and piling rigs. This equipment is sourced from more than 100 original equipment manufacturers (OEMs).

"Construction progress has a very high dependence on ensuring availability, proper utilization, and optimum productivity of the construction equipment fleet. Achieving this requires the ability to acquire, analyze, and derive business insights based on equipment operational data, health, location, utilization, production data, and take business decisions based on the insights derived—all in real time," explains Anantha Sayana, Chief Digital Officer at L&T Group.

Asset Insight—L&T's connected equipment platform

In one of L&T Construction's remote monitoring cells, an engineer analyzes equipment productivity versus internal hiring charges to decide on hiring of concrete batching plants. Another engineer zooms into the dashboard of a motor grader operating

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thousands of kilometers away to analyze and understand utilization and operating patterns.

Automated alerts generated by the connected weighbridges use advanced analytics and computer vision to help the operating personnel identify weighment anomalies. Insights derived from granular, real-time data have transformed equipment lifecycle management at L&T Construction.

"Asset Insight, our connected equipment platform that capitalizes on industrial IoT, advanced analytics, machine learning, and computer vision, has helped us create an ecosystem of connected products and services. As of today, more than 11,000 construction equipment across 450 sites are connected to the Asset Insight platform, streaming real-time data and information about location, utilization, production, operational, and health parameters. Insights derived from the Asset Insight platform have enabled us to increase equipment productivity, enhance capacity utilization, right-size assets, improve fuel efficiency, and reduce capital expenditure," says Balajikasiram S, Head – Digital at L&T Construction.

The Azure PaaS advantage

The Asset Insight platform was built using several Azure platform as a service (https://azure.microsoft.com/en-in/overview/what-is-paas/) (PaaS) components, namely, Azure IoT Hub (https://azure.microsoft.com/en-in/overview/what-is-paas/) , Stream Analytics (https://azure.microsoft.com/en-in/services/stream-analytics/) , Blob Storage (https://azure.microsoft.com/en-in/services/storage/blobs/) , HDInsight (https://azure.microsoft.com/en-in/services/hdinsight/) , Azure Cosmos DB (https://azure.microsoft.com/en-us/try/cosmosdb/) , Azure SQL Database (https://azure.microsoft.com/en-in/services/sql-database/) , App Service (https://azure.microsoft.com/en-in/services/app-service/) , and Microsoft Power BI (https://powerbi.microsoft.com/en-us/) .

There are several advantages to these PaaS components. For example, Azure IoT Hub helps in seamless ingestion of telemetry

data from thousands of field IoT gateways that are fitted on construction equipment. Stream Analytics creates robust streaming data pipelines flowing into Blob Storage. HDInsight provides enterprise-grade service for analytics, ranging from time series to machine learning that helps derive insights on equipment availability, utilization patterns, fuel efficiency, and productivity. And finally, business users consume insights using intuitive role-based dashboards developed with Power BI.

Armed with these insights, managers at L&T Construction can take various tangible actions, such as undertaking specific maintenance activities to improve equipment availability, and right-sizing equipment based on project requirements and past usage data. Other actions include releasing unused and underutilized equipment from construction sites and streamlining construction processes to improve productivity. Managers can provide operator training to facilitate proper equipment operation, improve productivity, and reduce equipment idling. In addition, they can share equipment output such as concrete produced by batching plants across multiple site locations, and dispense fuel based on equipment usage data.

"Azure IoT gives us real-time visibility into the operations at our project sites and enhances our ability to manage projects. We are delighted that we can provide our operating managers with accurate information and real-time insights on how their machines are performing. These specific insights have enabled our managers to take business decisions that have already given us significant operational benefits," adds Sayana.

"Our partnership with Microsoft augments our capability to unlock unparalleled efficiencies, intelligence, and productivity with the help of innovations in the cloud, IoT, and Artificial Intelligence," concludes S N Subrahmanyan, Chief Executive Officer and Managing Director at L&T Group.

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L&T Group

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