

TATA ELXSI

Whitepaper - Quick Commerce powered by 5G enabled Connected Drones: Revenue Models for OEMs | Telcos | Insurance

Driving Revenue & Scaling Delivery for Hyperscale Commerce through 5G enabled Connected Drone Platform

Author

[Ramprassanth Viswanathan](#) – Specialist, Connected Digital Platform & Solution (CDP) (CTO-Office, Tata Elxsi)
e-mail - info@tataelxsi.com



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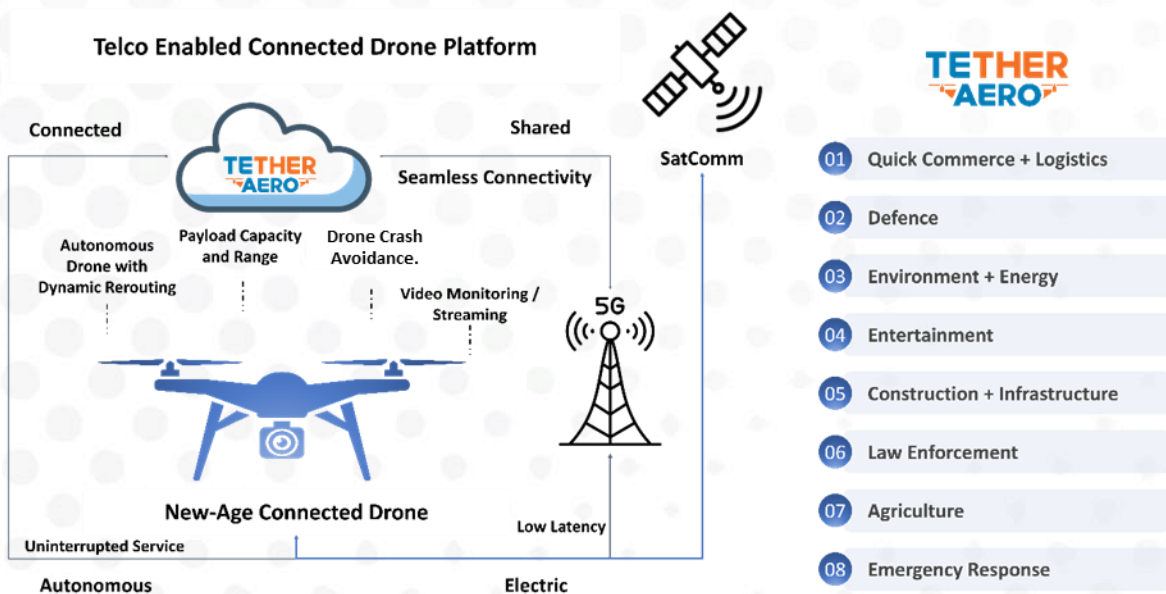
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Executive Summary

The fast-paced growth of quick commerce presents significant demands for innovative solutions focused on optimizing delivery, controlling costs, environmental well-being, and ensuring customer experience. This whitepaper outlines how Tata Elxsi's Connected Drone Platform, in collaboration with Mobile Network Operators (MNOs) leveraging [Linux Foundation's CAMARA APIs](#) powered by 5G technology empowers Drone Original Equipment Manufacturers (OEMs) to become smart connected drone service providers for quick commerce companies.

The Connected drone platform facilitates efficient, on-demand drone delivery, addressing critical challenges faced by the industry, particularly during peak demand hours through CASE - connected, autonomous, shared (secure), and electric features with seamless connectivity.



Owning the Future- Changing Market Demand & Shifting Business Model

1. The Challenge: Navigating the Complexities of Hyperlocal Delivery

Despite recognizing inherent industry challenges, quick commerce companies strive to maintain operational efficiency. Some of the challenges include

Dense Network of Dark Stores:

Zip codes are typically positioned with 1-3 dark stores spaced approximately 3 km apart, indicating a need for localized delivery solutions.

Variable Agent Availability:

Reliance on delivery agents with fluctuating online status leads to capacity constraints, particularly during peak hours.

Peak Hour Bottlenecks:

Order batching during peak times, where delivery agents handle two orders simultaneously, underscores the need for scalable and efficient delivery solutions.



Complicated routes and road traffic:

Efficient delivery is challenged by traffic congestion and complexity of delivery routes.

Dynamic Delivery Times:

Delivery times vary significantly based on distance, traffic congestion, and Delivery Agent's availability with SLAs ranging from 20 minutes to 1 Hour or at times App responds with "Service unavailability" without ensuring order fulfillment.

These challenges necessitate a robust and adaptable delivery infrastructure, making connected drone delivery an ideal solution that complements existing field agent delivery. Quick commerce companies can maintain their SLAs without disrupting their volume of orders during day-to-day order management and peak times.

2. The Solution: Tata Elxsi's Connected Drone Platform Powered by 5G

Connected Drone platform leverages the power of 5G connectivity to provide a comprehensive solution for drone-based hyper scale delivery.

How TATA ELXSI's Connected Drone Platform and Telco's CAMARA API create New Revenue Opportunities for Telcos and Drone OEMs through Connected Drone As a Service (CDaaS)?

Approach

Tata Elxsi's Connected Drone Platform with (CDaaS) framework enables OEMs to offer connected drone services via a subscription model to fleet operators and quick commercial businesses. By leveraging the power of 5G with dedicated network slices, Quality on Demand, and Location-based services, this subscription model opens new revenue streams for Telco and OEMs. This framework allows quick commerce companies to scale their delivery operations without the upfront cost of purchasing drones and its 5G-enabled delivery features.

The drone activates upon the fleet operator's on-demand subscription via the Drone Fleet app. The app allows the operator to select a drone by its Vehicle Identification Number (VIN) or Drone Identification Number (DIN), which are listed in the Fleet App. The app displays and allows operators to select a swappable battery based on the state of health (SOH), state of charge (SOC), and other battery metrics.

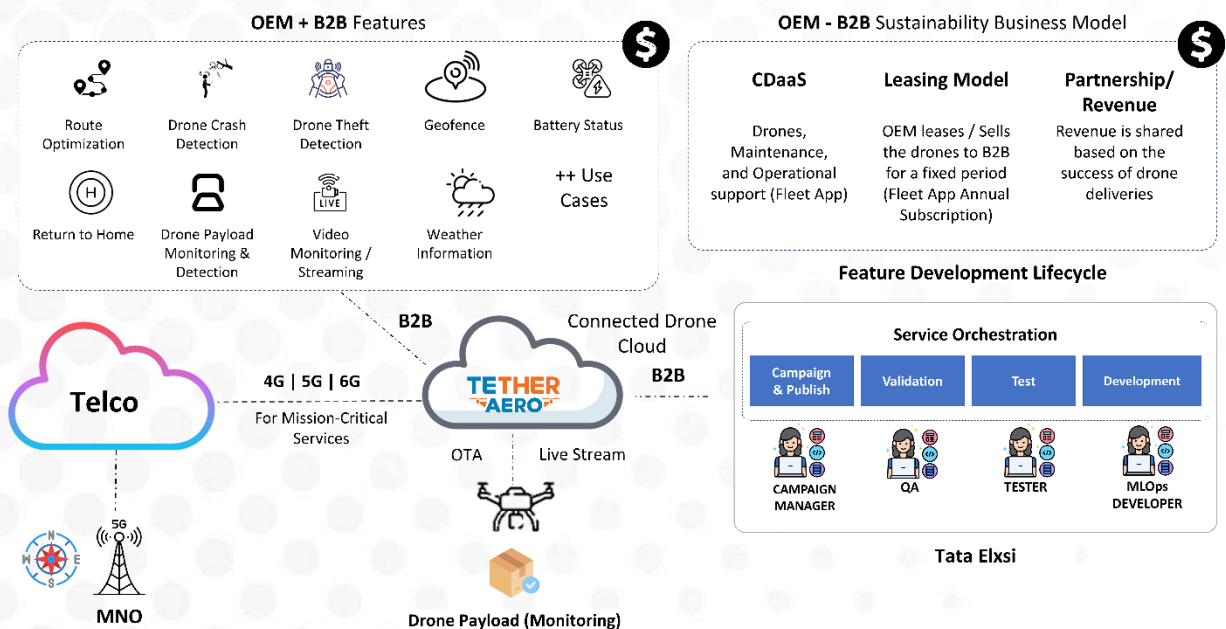
The Connected Drone Platform receives a subscription and battery request from the drone fleet app, triggering the activation of the specified drone (identified by VIN/DIN) from the cloud. Once a battery is installed in the swappable battery unit at 100% SOC, the drone is ready for payload fitting and flight.

The CDaaS framework complementing the connected drone platform allows quick commerce and drone fleet operators to flexibly subscribe to on-demand drones and swappable batteries, thereby creating a revenue stream for Drone OEMs.

The connected drone solution encompasses more than just CDaaS, it also provides monetization avenues for Mobile Network Operators (Telco). Capitalizing on the innovative APIs developed by the [GSMA](#) and [Linux Foundation](#), Tata Elxsi's Connected Drone Platform builds value-added services for B2B customers, creating new revenue streams for the Telco sector by leveraging [CAMARA](#) APIs.

Seamless 5G Integration with CAMARA API: Before launching a drone, regulatory approval is often required. This approval typically necessitates demonstrating assured connectivity throughout the entire flight path. Therefore, a robust **connectivity prediction** capability is crucial. This need for real-time connectivity assurance extends not only to the pre-launch phase but also continuously throughout the entire flight duration. Leveraging [Predictive Connectivity Data](#) API from the Connected Drone platform would significantly enhance the operational capabilities.

Powered by CAMARA Quality On Demand, and subscribing to [booking network slices](#) from the connected drone platform ensures reliable, low-latency connectivity, enabling real-time drone control and monitoring capabilities. Leveraging data transmission and [Location Retrieval](#) enables precise drone tracking for recovery in case of loss or theft, while ensuring smooth integration with current quick commerce operations.



Connected Drone Platform for OEM– Feature Enablement & Service Orchestration for B2B (Quick Commerce)

The connected drone platform offers robust real-time monitoring and analytics, providing comprehensive data on the connected drone, the drone's payload, (differential weight with and without payload), battery status, and delivery progress. These insights are invaluable for optimizing operational workflows and enhancing the overall quality of service delivery.

Furthermore, drone operators subscribing to the CAMARA [Geofencing Subscription API](#) through the connected drone platform receive instant notifications and alerts about safe and efficient ascents and descents at residential drone docking sites, ensuring operational awareness. Integrated geofencing functionalities are also crucial, guaranteeing adherence to local regulations and maintaining safe flight parameters.

Moreover, the platform actively monitors SLA compliance by leveraging CAMARA's [Population Density Data](#) API. This integration ensures adherence to safety regulations, vital for operations in populated areas, and for enabling Beyond Visual Line of Sight (BVLOS) flights, where meticulous risk assessment is paramount. By incorporating population density data into flight planning, the platform effectively minimizes ground risk, leading to safer and more reliable drone delivery operations.

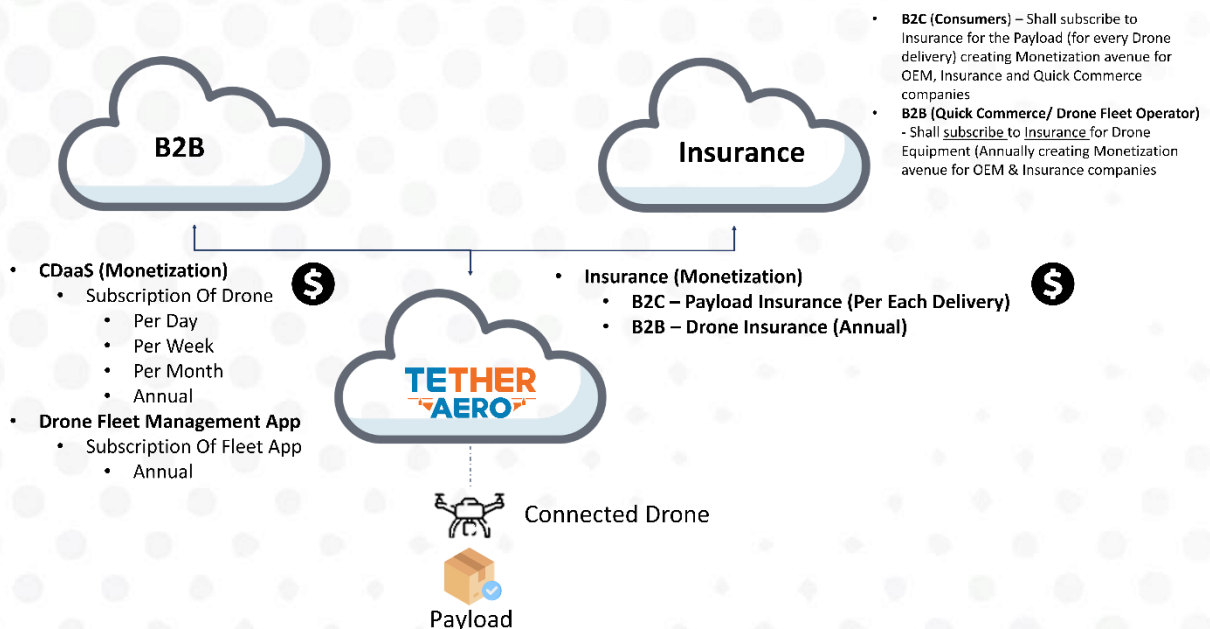


3. Enabling OEMs to Become Smart Drone Service Providers to Quick Commerce Companies

Tata Elxsi's connected drone platform empowers OEMs to:

Tata Elxsi's connected drone platform empowers OEMs to become smart drone service providers for quick commerce companies. The platform offers a rich set of out-of-the-box APIs, facilitating integration with existing enterprise B2B applications. Seamless communication is ensured through 5G connectivity and offers a comprehensive drone delivery solution. These solutions include operations, AI/ML-driven predictive maintenance, OTA support, data analytics, digital twin capabilities, and continuous operational and platform enhancements based on business requirements. The connected drone platform allows OEMs to customize connected drone delivery solutions to meet the specific demands of quick commerce, including monitoring payload capacity, delivery range, integration with existing infrastructure, such as dark or cold stores, and integration with docking stations.

Furthermore, by leveraging partnerships with Cloud Service Providers and offering Tata Elxsi's scalable Connected Drone as a Service (CDaaS) subscription framework, quick commerce companies can efficiently scale their drone delivery operations on demand through a dedicated Drone Fleet app, eliminating the need for significant upfront capital expenditure. The platform also facilitates payload monitoring through integration with the insurance cloud infrastructure, ensuring secure and reliable order delivery, thereby unlocking new revenue streams for quick commerce businesses, insurance companies, and the OEMs themselves.



Connected Drone Platform Monetization Enablement for OEM & Quick Commerce through Insurance Partner

4. Addressing Peak Hour Challenges with Connected Drone Platform & Services

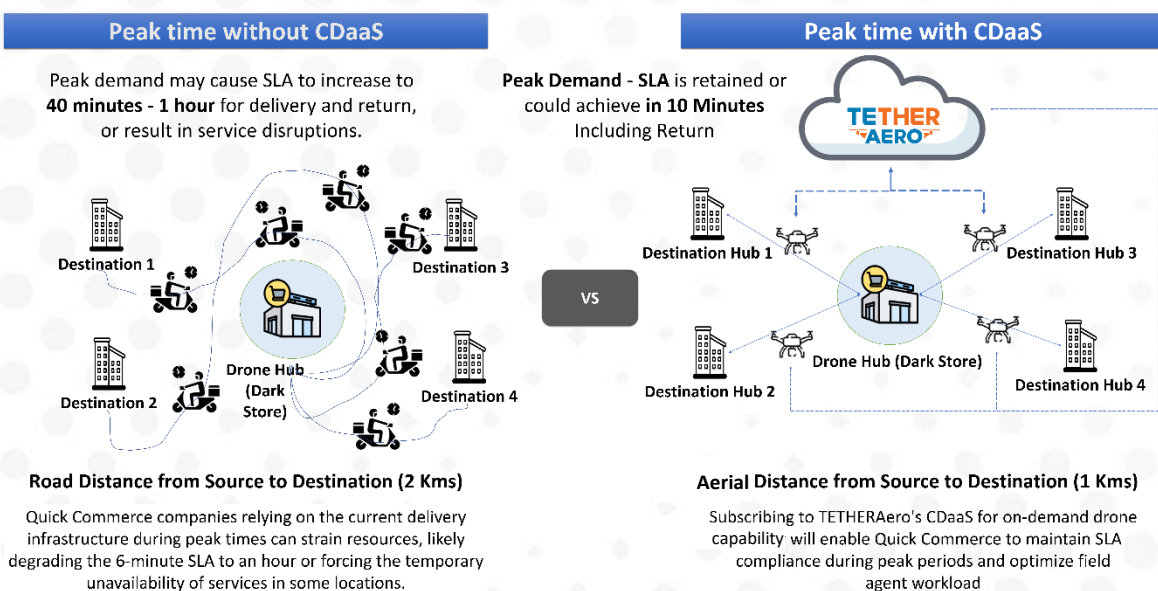
The Whitepaper also highlights the critical need for efficient scalable connected drone delivery solution. Leveraging strategic partnerships with Cloud Service Providers (CSPs) for platform scalability to meet data ingestion and device onboarding, and leveraging [Linux Foundation's](#) CAMARA APIs, with 5G capabilities through MNO partnership, Tata Elxsi's Connected Drone platform offers a robust solution for addressing peak-hour delivery demands.

1 Reducing Delivery Times: Connected Drones monitored through Connected Drone Platform can bypass traffic congestion and optimize delivery routes, significantly reducing delivery times compared to traditional methods.

2 Enabling Multi-Order Delivery: Connected Drones equipped with multi-payload systems can efficiently deliver two orders to separate locations, replicating the order batching strategy used by delivery agents, there by complimenting the Delivery agent during peak hour window there by the SLAs are optimized.

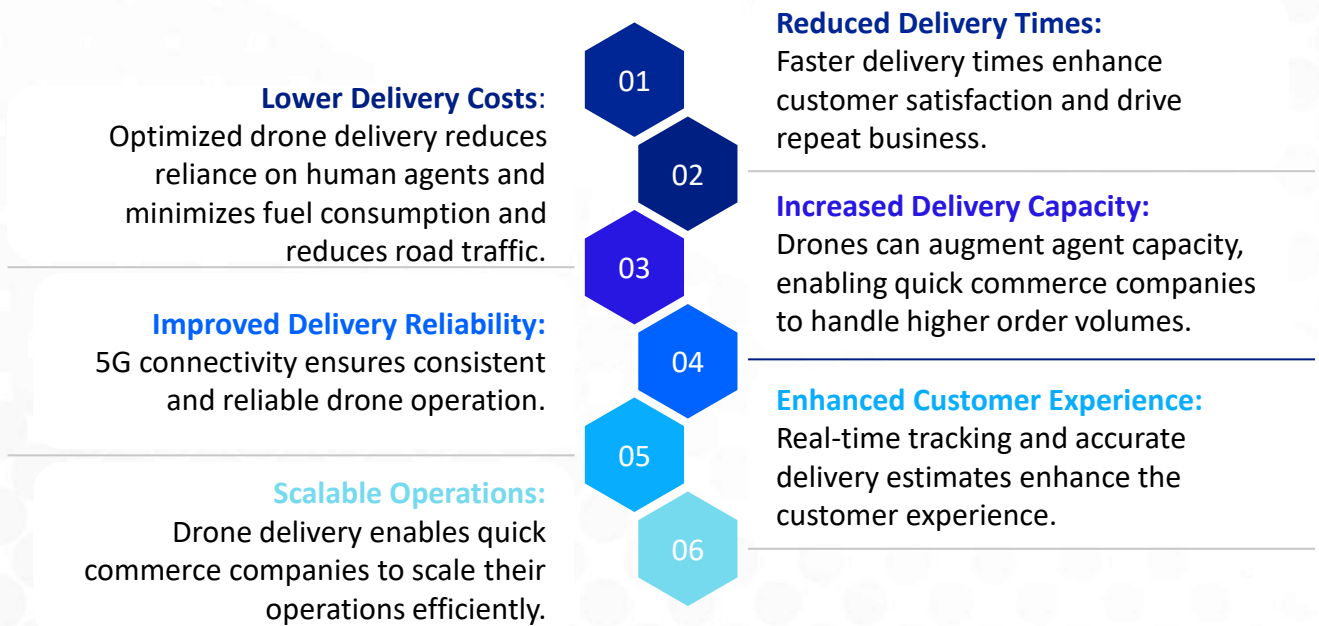
3 Augmenting Delivery Agent Capacity: The Connected Drone supports delivery agents by shouldering the delivery capacity during peak hours, facilitating faster and more reliable order fulfillment.

4 Providing Reliable Delivery during High Demand: 5G connectivity coupled with CAMARA Geofencing Subscriptions provides reliable drone operation under high-order demand. The platform enables operators to real-time track the drone and its payload and receive timely alerts via the integrated platform and docking station, significantly enhancing the security of high-value payload delivery.

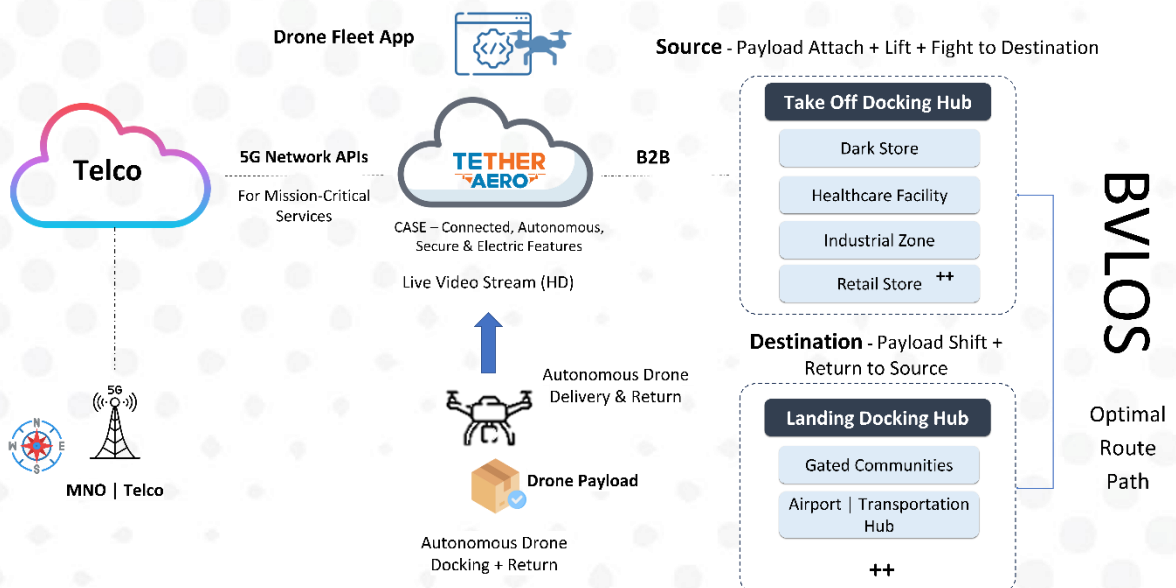


Connected Drone-as-a-Service: Scaling for Peak Demand

5. Benefits for Quick Commerce Companies



The integration of drone delivery offers a transformative advantage for quick commerce companies. Tata Elxsi's innovative CDaaS framework not only streamlines operational expenses but also actively contributes to sustainable operation with a reduced environmental impact. Connected drone delivery also increases the capacity of delivery operations, enabling quick commerce companies to handle higher order volumes and work in tandem with traditional agents without affecting SLAs. By adopting Tata Elxsi's 5G-enabled connected drone technology, quick commerce companies can dynamically scale operations to meet evolving market demands, achieve enhanced delivery speeds, directly translate to enhanced customer satisfaction, and foster brand loyalty.



6. Vision for Evolution

Tata Elxsi also foresees the transformative potential of scaling the Connected Drone as a Service (CDaaS) model into diverse business spaces. For example, healthcare, drones enable the rapid delivery of critical emergency supplies. Consider advancements in agriculture, with drones providing precise crop management and data-driven insights. Life-saving possibilities within emergency services offer enhanced situational awareness and swift delivery of aid. These are only a few glimpses into the trajectory of the Connected Drone Solution. By strategically exploring these avenues, Tata Elxsi aims to unlock new value propositions, address critical societal needs, and solidify its position as a leader in the evolving drone ecosystem with the power of 5G and 6G technology.



7. Conclusion



Tata Elxsi's Connected Drone Platform, powered by Telco 5G, provides a transformative solution for quick commerce delivery through Connected Drone as a Service (CDaaS). By providing OEMs with a robust connected drone platform and smart drone service solutions, Tata Elxsi fosters strategic partnerships that enable drone OEMs to deliver significant value to quick commerce customers, driving operational efficiency and market expansion. Tata Elxsi's Connected Drone platform with Connected Drone as a Service (CDaaS) business model, powered by MNOs' CAMARA Network APIs through seamless 5G connectivity, ensures efficient, reliable, and scalable drone delivery, revolutionizing and future-proofing the quick commerce customers.


Author –

Ramprasshanth Viswanathan

Specialist – CTO Office, Tata Elxsi

7. Reference

- [GSMA - Outdoor Drones](#)
- [CAMARA Project - Population-Density-Data](#)
- [CAMARA Project - Predictive Connectivity Data](#)
- [CAMARA Project - Connectivity-Insights](#)
- [GSMA – 5G-Connected Drones Promise Better Security/](#)
- [Tata Elxsi.- CASE Connected-Cars](#)
- [GSMA 5G -Connected-Drones-Promise-Better-Security-2/](#)
- [CAMARA Project](#)

An aerial night view of a city, likely Bangalore, with numerous skyscrapers and buildings illuminated. A satellite is visible in orbit above the city, connected by a network of lines representing a global network. The background is a dark blue sky with some clouds.

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TATA ELXSI

Tata Elxsi Limited, ITPB Road,
Whitefield Bangalore 560048, India

+91 80 2297 9123

info@tataelxsi.com

www.tataelxsi.com



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