

INTERNET OF THINGS (IoT) MONETISATION

THINK FUTURE - THINK. TRANSFORM.

It is estimated that there are over 8.4 billion connected “things” (devices, appliances, machines and others) in the world today. Do you know how your business can derive value from the Internet of Things?

The IoT monetisation market is likely to witness a boom in the years to come. As per Allied Market’s report on IoT monetisation market, the growth is due to the greater penetration of connected devices, the growing number of smart cities and the rise in the adoption of cloud-based services.

Internet of Things (IoT) has become a promising technology for addressing social challenges – connecting smart devices and enabling big data analytics for creating intelligent ecosystems worldwide. The information and analytics from IoT and Big Data find significant application in optimising a city's infrastructure, keeping citizens connected and secure, and using its resources more efficiently.

Several CSPs around the world are working on technological innovations and innovative IoT use cases and commoditisation of hardware. Rapidly growing IoT adoption across various industry verticals has increased the urgency for CSPs' digital transformation. The digitisation of machines, automotive, farms, homes, utilities, industrial units, and healthcare has opened a new unique and disparate opportunities for CSPs like paid-for endpoints, applications and connected service revenues.

To capitalise on the IoT opportunities, CSPs will have to deal with wide scattered ecosystem of platforms, end-points, vertical specific apps and vendors. Traditionally CSPs, owing to their nature of business, will have an uphill task to manage such diverse ecosystem, to test various end points, apps and network to ensure the end service QoS expectations.

TCTS IS AN ABLE PARTNER FOR CSPS IOT NEEDS

- We understand the complexity of keeping up with new solutions, identifying right components from different suppliers, handling hybrid network environments (Sigfox, NB-IoT, Cellular networks, and Wi-Fi, etc.) and the requirement of robust, proven integration capabilities.
- We manage multiple partner ecosystems needed to run IoT services in agile and cost-effective manner
- Our strong telco heritage provides us complete insight on CSPs pain points and an edge across-geographies to identify price sensitivities, provide customised & optimised solution, with flexible commercial models
- Vendor & technology agnostic
- On-going engagements with global telcos in different IoT areas:
 - Network Managed Services
 - Smart Utilities
 - Smart Cities
 - Transport/ Telematics
- Customised solution designs for:
 - Established telcos in IoT domain
 - Telcos with vertical solution deployments
 - New entrants in the IoT Market

Tata Communications Transformation Services (TCTS), with a decade long experience in telecom managed services, is enabling the world's largest IoT network on LoRA in India. As an end-to-end orchestrator for IoT services, TCTS services span across the IoT value chain. Tata Communications is at the forefront of IoT development in India, offering innovative, comprehensive and scalable solutions for smart cities and their citizens.

THE IOT TEST-BED OF THE WORLD

With India's largest IoT network being rolled out by Tata Communications, we are presently building an IoT ecosystem for enabling TCTS to be AN END-TO-END ORCHESTRATOR and helping CSPs across various industry verticals to identify and deploy best-in-class IoT solutions by acting as an integrator of multiple elements within the IoT value chain. While TCTS operates as an end-to-end system integrator, TCTS approach is also very modular and verticalised to suit specific industry needs.

EXPLORE TCTS IOT SERVICES CUSTOM MADE FOR YOUR NEED

We offer IoT solutions across the entire value chain with both as an integrated/turnkey and modular approach

ENABLING DELIVERY OF IOT SERVICES EFFICIENTLY

WE OFFER TURNKEY IOT SOLUTIONS PLAYING ACROSS ENTIRE VALUE CHAIN



BUILDING AN IOT NETWORK

- Understand & define access network topology
- Plan and build the network according to coverage or defined use cases
- Network operation & maintenance



SOFTWARE ELEMENTS & VERTICAL USE CASE

- Platform identification, deployment & integration with existing infrastructure
- Develop end-to-end use cases (sensors, applications, additional s/w modules)



COMMAND & CONTROL CENTRE: OPERATIONS & MAINTENANCE

- Build & run a management centre controlling all elements
- Critical support in managing SLA/ KPIs
- Fault & performance management



TECHNOLOGY CONSULTING

- TCTS can help select the right access technology basis the use case required
- Business Enablement Services

THE INTERNET OF THINGS IS NOT THE FUTURE – IT IS NOW!

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TATA COMMUNICATIONS INTERNET OF THINGS - USE CASES

Asset Tracking solution

- Visibility of any asset movement in the field
- Monitor assets at different locations
- Asset condition monitoring, predictive forecast, reliability-center maintenance
- Reduce asset loss, increase asset utilisation and prevent misuse



Digital Workforce

- Empower data & tools to improve operational efficiency
- Monitor workers vital stats and work environment conditions
- Prevent accidents and safety incidents at work
- Control access to restricted zones



Environment Monitoring

- Sensors to monitor environmental parameters accurately
- Capable of measuring temperature, humidity, lux, ambient noise, wind speed, CO, CO2, NO2, SO2, O3, H2S, PM2.5/ PM10
- Easy to integrate into dashboard and ERP system



Intelligent Traffic Management System

- E-Challan/ E-Ticketing solution
- Throughput acceleration
- Traffic reduction
- Traffic optimisation
- Service monetisation
- Centrally controlled traffic signals
- Electronic toll collection



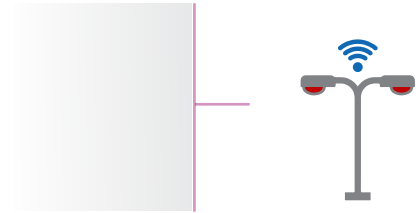
Waste Management

- Smart bins and platform for waste collection, vehicle tracking, dynamic scheduling & routing
- Weight automation
- Mapping with city GIS
- Workforce management, staff attendance
- Centralised municipal database
- Citizen feedback mechanism



Smart Lighting Solution

- Enable better management of energy by orchestrating street lights
- Two-way communication between street lights and the City Command Centre
- Define and automate the behaviour of street lights
- Optimising energy consumption and enabling predictive maintenance



Smart Button Solution

- Harness the power of feedback and address citizen service requests conveniently with a simple click
- Enhance customer experience at city facilities for proactive remedial measures



Automated Metering Solution

- Monitor customer usage through automated meter reading and data processing for water/GAS/Electricity
- Reduce manual intervention & opex cost
- Collect accurate base line data for consumption patterns
- Demand forecasting, capacity, distribution and load management



Smart Parking

- Complete ecosystem connecting commuters to city parking space
- Obtain real time awareness of slot occupancy
- Use of smart apps via phone for pre-booking or re-lease of parking slot
- Connectivity to POS for easy and safe payment option



City Surveillance

- Monitoring & managing crowd behaviour, footfall, Face Recognition (FR), ANRP by using CCTV & video analytics platform
- Optimise resource allocation for emergency response
- Enforce traffic regulation and penalisation of offenders



MANAGING THE WORLD LARGEST LORAWAN IOT NETWORK WHICH IS BEING DEPLOYED IN 38 CITIES IN INDIA AND WILL COVER MOST OF INDIAN CITIES & TOWNS BY THE END OF 2020

Scope

- Operating 24x7 Network & Device Management Centre
- Field Operations & Maintenance
- Customer and Service Delivery
- Inventory and Vendor Management

Business Drivers

- Implementing sites on time as per business and coverage requirement
- Quick fault logging and manage end-to-end lifecycle
- Prompt field support to fix hardware faults.
- Swift onboarding of customers and devices

Key Activity Facets

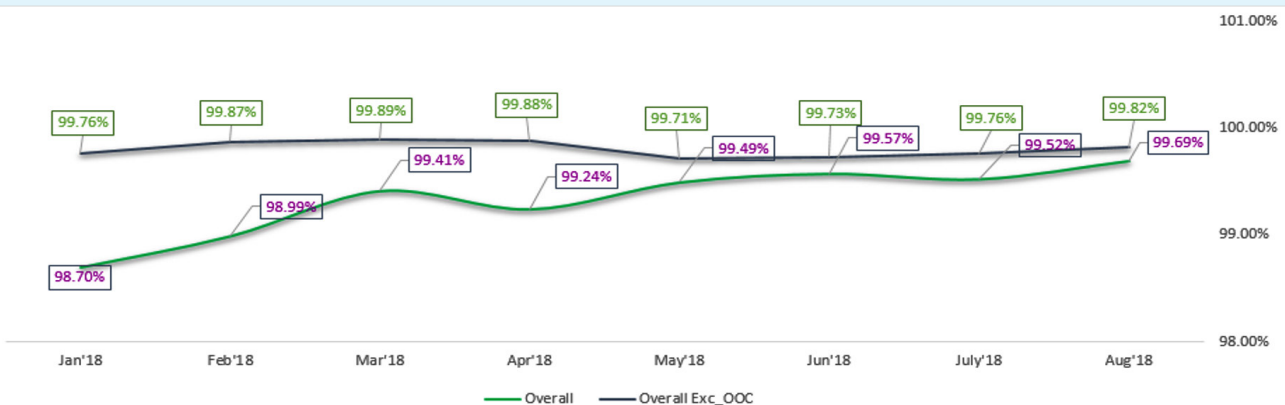
- Network and Field Operations: Field support to fix hardware issues. Plan, schedule and execute preventive maintenance
- Problem management: Root-cause analysis on repeated issues and identify problem area, identify repeat issues and trigger proactive action to ensure permanent fix.
- Vendor and payment management: Alert vendors on incidents and ensure timely restoration & timely payment to vendors and avoid service disruption.
- Performance and product improvement: Record and monitor various KPIs and ensure timely action on problem area.
- Inventory Management: Spare Management & R&R process with multiple device vendors.

Benefits Delivered

Improved Performance

Network uptime consistently maintained above **99.70%** from last 2 quarters

Team is able to efficiently manage **2000 +** network incidents every month



Products Supported	Kerlink, Orbiwise, HPE UIoT, MARS, VEDANG
Equipment and Platform	<ul style="list-style-type: none"> • Gateway • Orbiwise Network Server • HPE UIoT VPC Linux servers and DB
Tools	<ul style="list-style-type: none"> • Orbiwise network supervision tool • RESOLVE: TCTS monitoring and incident management tool • SUCHEE: TCTS inventory management tool

TRANSFORMING A STEEL CITY INTO A SMART CITY



Jamshedpur Utilities and Services Company (JUSCO)

Jusco is India's only comprehensive urban infrastructure service provider. Carved out of Tata Steel, from its Town Services Division in 2004, the company's mandate was to convert an obligatory service into a customer-focused sustainable corporate entity.



Key use cases running include



- Sewage network management (Manhole monitoring)
- Workforce tracking
- Water quality control
- Transformer monitoring
- Smart street lights
- Water/Gas AMR
- Surveillance / door sensors
- Waste management
- Intrusion detection



JUSCO IS WORKING WITH TATA TO IMPROVE UTILITY SERVICES IN JAMSHEDPUR

TCTS BRINGS TOGETHER THE REAL WORLD EXPERIENCES FROM ACROSS INDUSTRIES ALONG WITH THE COMPLETE IoT ECOSYSTEM FOR CSPs TO RAPIDLY MONETISE THE IOT OPPORTUNITIES IN THEIR RESPECTIVE MARKETS

WHAT MAKES TCTS UNIQUE?

- **Sensors:** Leverage our ecosystem play to help you identify the right hardware specific to the identified use-case and also factor in the price sensitivities that exist linked to the market
- **Networks and technology:** Our choices and recommendations are based on real world trials with most of our solutions tested within our networks[†].
- **Analytics:** We help you make sense of big data and convert it into appropriate automations and actions.
- **Integration services:** IoT integrations demand much deeper and wider telco experience as compared to COTS software integration as it involves more operations solutions alongside automation needs.
- **Innovative engagement models:** Choose from a wide range of flexible commercial models from revenue and gain share or pay as you go based on your market conditions
- **Real world solutions:** As a standard approach most of our solutions are tried and live tested within our networks[†] globally.
- **Operational capability:** Highly skilled resources with multi-zvendor / technology approach for IoT deployments

About Tata Communications Transformation Services (TCTS)

Tata Communications Transformation Services (TCTS), a 100% subsidiary of Tata Communications Ltd, provides leading business transformation, managed network operations, network outsourcing and consultancy services to telecommunication companies around the world. TCTS delivers operational efficiency, cost transformation and revenue acceleration solutions for all the stages of the carrier process lifecycle including but not limited to network engineering and design, implementation and operations functions.

TCTS is a part of the USD \$100+ billion Tata group. Tata group comprises of over 100 operating companies in seven business sectors. TCTS leverages the market expertise of Tata group's global telecom operation capabilities and globally established IT, process and consulting skills. It carries the rich traditions and business ethics of the Tata companies.

For more details on TCTS and how we can help your company build, operate and transform, please contact us at tcts.marketing@tatacommunications.com or visit www.tatacommunications-ts.com. To hear more from TCTS experts, join us on LinkedIn <https://www.linkedin.com/company/tata-communications-transformation-services> and follow us on Twitter https://twitter.com/Tata_TCTSL.

