

Rethinking Meter Data Management for India's Smart Metering Scale: Interview

Apparent Energy is migrating meter data management to a software-as-a-service architecture to meet India's scale and operational requirements

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As India accelerates the rollout of smart meters under the Revamped Distribution Sector Scheme (RDSS), one challenge is becoming increasingly evident, i.e., hardware alone cannot fix the distribution sector's long-standing inefficiencies. At the heart of the transition lies software, specifically the ability to process, secure, and analyze massive volumes of meter data in real time.

In an interview with Mercom India, Abhishek Sharma and Ranjana Rani of [Apparent Energy](#) outlined how the company is building a fully indigenous, cloud-native meter data management (MDM) platform designed to support the digital transitions of India's future power grid.

Our primary customers are utilities and distribution companies (DISCOMs). MDM solutions are relatively new in India because smart meter deployment at scale is still in its early stages. Globally, MDM systems have existed since around 2005–2006 and were traditionally deployed on-premises. We are migrating MDM to a software-as-a-service architecture, which is better suited to India's scale and operational requirements.

Why is an MDM platform critical to India's smart metering rollout, beyond the deployment of smart meters?

Smart meters generate massive volumes of real-time data, but without an MDM platform, this data has no operational or financial value. An MDM acts as the digital backbone of smart metering, validating meter data, enabling billing automation, detecting losses, supporting demand forecasting, and integrating with DISCOM IT systems. In India's RDSS-driven rollout, meters digitize consumption – MDM digitizes grid intelligence and revenue assurance. Without MDM, smart metering becomes a hardware exercise rather than a grid transformation program.

Utilities face challenges such as AT&C losses, fragmented data, cybersecurity risks, and limited analytics capabilities. How does your system address these challenges?

When RDSS was launched in 2021, pilots began, and foreign players entered the market. But India's smart metering program operates under the design-build-finance-own-operate-transfer model, in which the Advanced Metering Infrastructure Service Provider bears the investment risk. DISCOMs initially adopted foreign solutions because there were no alternatives, but later found them expensive, CAPEX-heavy, and dependent on third parties for implementation and support. We designed our system differently to support India's scale and requirements.

Our platform is built specifically for Indian DISCOM realities:

- **AT&C loss reduction:** AI-based anomaly detection identifies theft, meter bypass, transformer-level losses, and abnormal consumption patterns in near real time.
- **Unified data layer:** We consolidate data from smart meters, DT meters, billing, outages, and SCADA into a single

- Cybersecurity by design. End-to-end encryption, role-based access, audit trails, and secure API frameworks aligned with national digital infrastructure standards.
- Actionable analytics: Not just dashboards – predictive insights for revenue leakage, asset health, load forecasting, and outage prevention.

In short, we convert raw meter data into financial recovery, operational efficiency, and grid resilience, which is what DISCOMs urgently need.

What makes your platform architecture different from legacy MDM deployments?

We separate transactional operations, such as meter reads and validations, from analytics. At the same time, the same real-time transactional data is made available through a dedicated data lake for analytics. This enables DISCOMs or third-party tools (such as BigQuery, Power BI, or Databricks) to integrate with the platform without relying only on transactional databases. This aligns with the India Energy Stack vision of treating energy data as digital public infrastructure.

How are utilities currently managing meter data management, and what gaps do you see in the current ecosystem?

Most utilities are not managing MDM directly. Advanced Metering Infrastructure Service Providers install meters and provide bundled MDM solutions from different vendors. Early Indian providers struggled as meter volumes increased, and even large companies that attempted to build in-house systems were unable to make them work at scale despite spending one to two years on development.

What is the scale of the data challenge in India, and why does it matter for AI and analytics in distribution?

India is moving toward around 250 million smart meters, and this data will be foundational for the distribution sector. Without this data in place, analytics, artificial intelligence, and machine learning cannot function effectively because data is the basic building block.

Many states are already dealing with renewable variability and curtailment. Can MDM enable more responsive grid operations?

will be important for demand response programs and renewable integration. Bharat Grid Sync MDM is the first phase. Once data is available at scale, we will build renewable integration capabilities on top of it.

How will your roadmap evolve beyond MDM into renewable integration and broader grid intelligence?

After MDM, our solution will integrate with renewable sites such as solar and wind farms. We aim to incorporate signals such as power exchange prices and the charging/discharging behavior of battery energy storage systems. The goal is to provide insights on when energy should be stored and when it should be released to the grid, enabling more autonomous grid operation while keeping humans in the loop.

Beyond DISCOMs, which other stakeholders could benefit from your platform over time?

Most current use cases are focused on the distribution sector, so DISCOMs are the primary users. Use cases such as demand forecasting, distributed energy resource integration, and demand response will also remain largely under DISCOM operations. State load dispatch centers and regional load dispatch centers may become relevant in later phases once deeper renewable integration into grid operations begins.

Given the sensitivity of grid and consumer data, how do you address data residency and security concerns?

No data leaves India, not even a single byte. The solution is completely indigenous. Engineering, development, and operations are all based in India. It is a Make in India product, with data residency fully within India.

What does implementation look like for DISCOMs with legacy systems, and how do you handle migration?

The system is readily deployable. If utilities have historical data in legacy systems and want to continue using it for analysis, we provide mechanisms to migrate it to our platform. There is minimal effort required from the DISCOM; our engineering team handles the migration and integration work.

We are running pilots with BSES in Delhi and the Chhattisgarh State Power Distribution Company. The process starts with integration into the utility's existing systems, followed by system acceptance testing over at least two billing cycles. Utilities verify billing accuracy, load handling, and tariff scenarios before go-live. Once testing is complete, the system moves into production.

How scalable is the platform for large deployments involving tens of millions of meters?

Scalability is not a concern. The architecture is microservices-based and fully auto-scalable. Whether a DISCOM has five million meters or several billion meters, the platform can handle it. During pilots, we test the platform at double the expected meter count to ensure future readiness.

**Arjun Joshi**[More articles from Arjun Joshi.](#)

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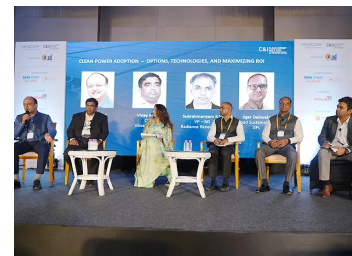
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