

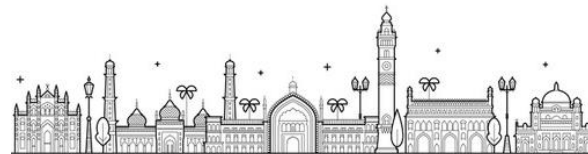


Digitalisation of Utilities

Presented By

Dwarka Srinath, CDIO, Tata Power Pvt. Ltd.

Distribution Utility Meet | 14 - 15 November 2024 | www.dumindia.in



Business goals & Emerging Challenges

Workforce
Efficiency

Billing
Efficiency

100% OCR

Collection
Efficiency

Digital
Payments

AT&C Loss reduction

Operational Excellence

Asset
Monitoring

Work Force
Efficiency

Network
resilience

Outage
management &
Customer
experience

Data &
Analytics – Self
Serve

Safety

Customer Centricity

New Business
Models/Energy Transition

Digital Self
Serve

Omni Channel
Experience

NPS/CSAT/RFT

Planning and
Operations

Prosumers
models

Visibility incl.
BTM Assets

Customer Channels

Mobile App

Mobile Messengers

Web

IVR

SMS

Missed Call

Social

Voice & CTI

Data

Data Warehouse

Dashboards

Advanced Analytics/AI/ML

Rules Engine

Data Science- ML

AI – Image, ..

Core

ADMS

DMS

SCADA/Historian

GIS

Outage

ERP

Workforce Management

Power Planning

Field Force Apps

Meter Data Management

Billing & Payments

Customer management

Integration

API

ESB

Data

Networks & Infra

Data Center

Cloud

LAN/WAN

OT Assets

IOT/Sensors

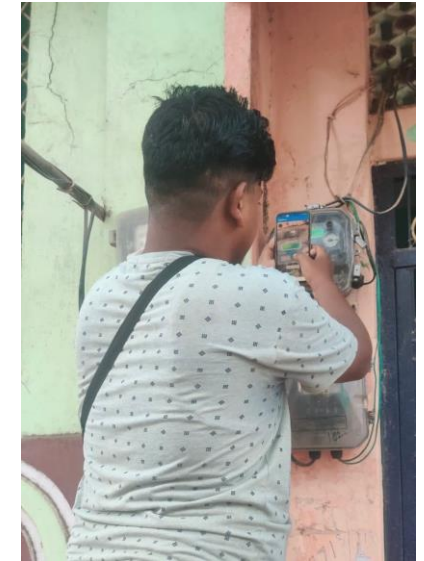
Transmission and Distribution assets

AMI

.....

AI enabled OCR based Meter Reading

- Meter readers use OCR enabled spot meter reading and billing app for door to door meter reading and billing.
- AI powered OCR technology extracts meter reading from meter images and reduces manual intervention in meter reading process.



Detection of tamper from meter photos via Image Analytics

- Meter Images are captured during door to door spot billing
- Processed through an image analytics application for tamper detection

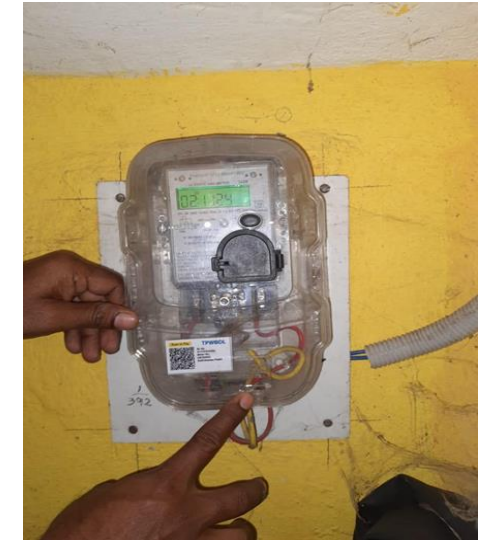
Technology :- Image analytics



Dynamic QR code for payment

- Every consumer can have a permanent distinct QR code (in the form of a sticker or card).
- The Tata Power QR code is UPI intent based and consists of the CA number and a deep link encrypted inside.

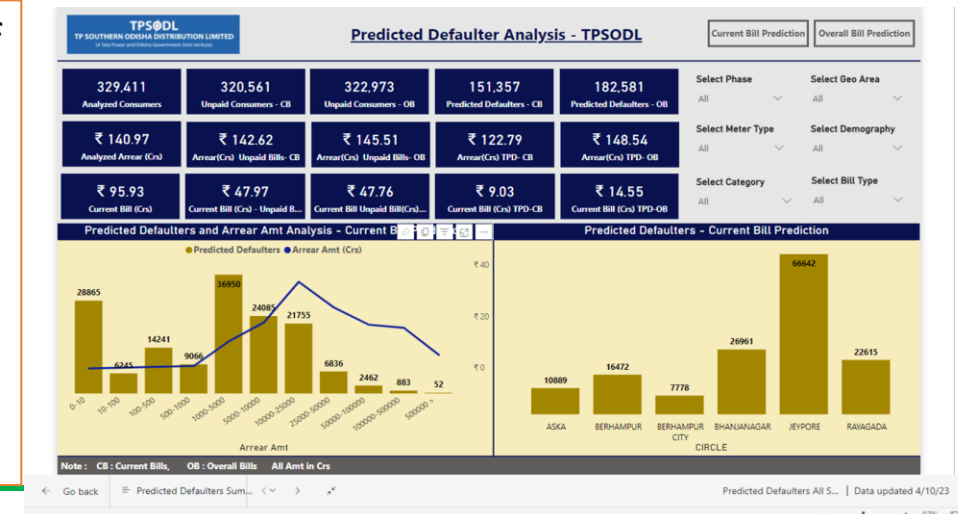
Technology :- Integration



Payment Prediction dashboard – Defaulter Analysis

- Consumer wise prediction (with individual percentage likelihood of default) using ML for focused collection drives
- Model prepared based on past consumer behavior, category, area (urban/rural), geography, etc.

Technology :- Supervised Learning



Collection Efficiency

Government Consumer Management System

- Mobile app and web application to enable Gram Panchayats to pay their electricity dues.
- First utility in India to integrate with GoI's e-Gram Swaraj system to facilitate online payment by Gram Panchayats.
- Timely reconciliation of payments and resolution of bill disputes



Government Consumer Management System
Panchayati Raj and Drinking Water Department,
Government of Odisha

LOGIN

Mobile Number
9348616500 **Get Otp**

OTP
9999

H011#0 **H011#0**

SUBMIT

[Download APK](#)
[User Manual](#)

GCMS

GRAMPANCHAYAT:
Barimunda, Chandaka, Daruthenga, Sisupal...

Pending for Verification (3)
₹ 2,79,696

Pending for Payment Cases (5)
₹ 15,60,516

Disputed Cases (1)
₹ 1,14,101

BACK HOME LOGOUT

F. No. 12/11/2021-UR&SI-II-(E-258371)

Government of India
Ministry of Power

Shram Shakti Bhawan, Rafi Marg
New Delhi, Dated: 28th June, 2024

To
Additional Chief Secretary/ Principal Secretary/ Secretary (Energy/ Power) of
all States and UTs.

Subject: Integration of eGram Swaraj Portal with DISCOM Bill Payment
Systems.

Sir/ Madam,

With reference to the above cited subject, I am directed to say that Ministry of Panchayati Raj (MoPR) vide letter no. M-11015/122/2024-FD dated 22.6.2024 (Annexure-I), has informed about an initiative taken to integrate its flagship portal <https://egramswaraj.gov.in/>, with the electricity bill payment interface of respective DISCOMs of various states.

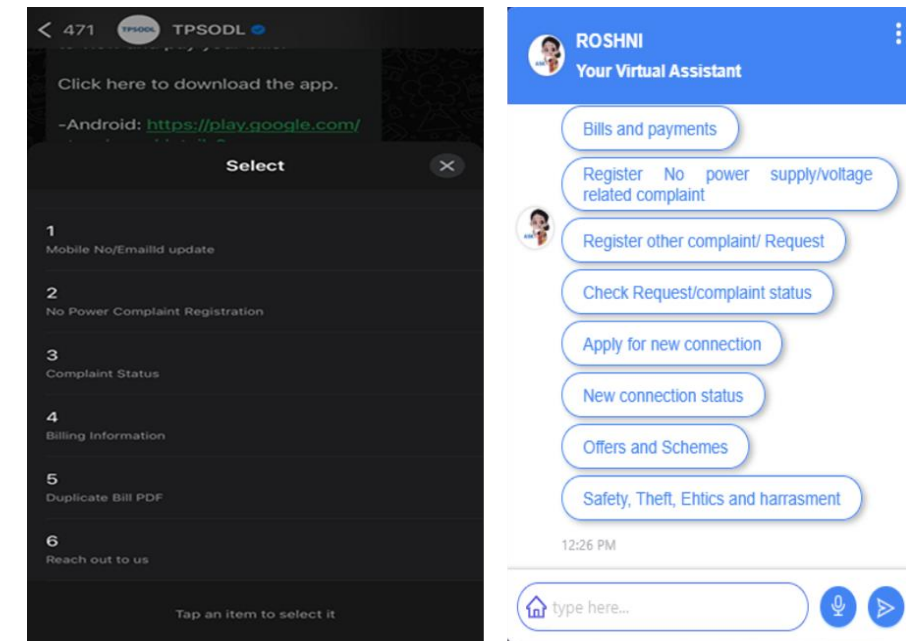
3. It has further informed that as a pilot project, the electricity bill payment interface of the Odisha DISCOMs (Tata Power) has been successfully integrated with the eGram Swaraj portal. This initiative allows the PRIs of Odisha to make online payments for their electricity bills, promoting ease of payment and enabling DISCOMs to monitor pending payments more effectively.

SELF SERVE :- No Power Complaint Resolution-Missed Call, Whatsapp and Customer Portal/App

- No Power Complaint can be raised by consumers by simply giving a missed call to a designated number from their registered phone number
- In customer app/portal, consumer can raise a No Power Complaint via single click of a button.

SELF SERVE :- Chatbot-Website and WhatsApp

- Self Serve Opportunities for various complaints
- Chatbot available in Website as well as via interactive WhatsApp bot



Social Listening

- One Integrated tool for Listening and Response to most digital platforms(Twitter, FB..)
- Sentiments - cloud based on word/tags
- Continuous Improvement projects for Areas of Customer dissatisfaction
- Handle with care processes Desks – High Influencers

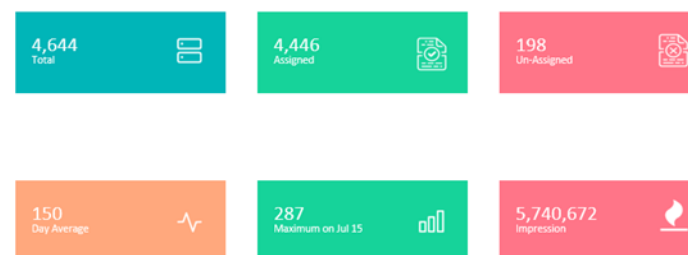
Technology – Software as a service (Reusable for Renewables and EV), ML for sentiment Analytics, Gen AI for response Drafting

Auto Allocation & NP Mobile App

- No Power Complaint from various auto allocated to Lineman in the specific areas



SUMMARY : For the month of July 24



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NOTIFICATION DATA

Search by CA / Area / Feeder

Select All Submit Acknowledgement

Village/Area: NUJAPADA

Notification Number	Date/Time
4300723000031	30-07-2023 11:05:47

Phone Number: 8144902568 CA: [redacted]

Feeder: MAJHAPADA (ODSSP)DHARUADIHI

Consumer Name || Address || Remark || Issue Type || Source || Voltage Level || FCC Name || Call Created By || ETR || Predicted Fault

Babu Sahoo || Plot no 201/5, Near ITI college || No power at colony || No Power Supply-Area || FCCA||null||DHURUADIHI||Aloke Dibesh ||

ACKNOWLEDGE

NOTIFICATION DATA

Search by CA / Area / Feeder

Select All Submit Acknowledgement

Village/Area: NUJAPADA

Notification Number: 4300723000031 Date/Time: 30-07-2023 11:05:47

Estimated Time of Resolution

PREDICTED FAULT: Normal Fuse Off

ENTER ETA IN HOUR: 01 ENTER ETR IN MINUTE: 30

Submit

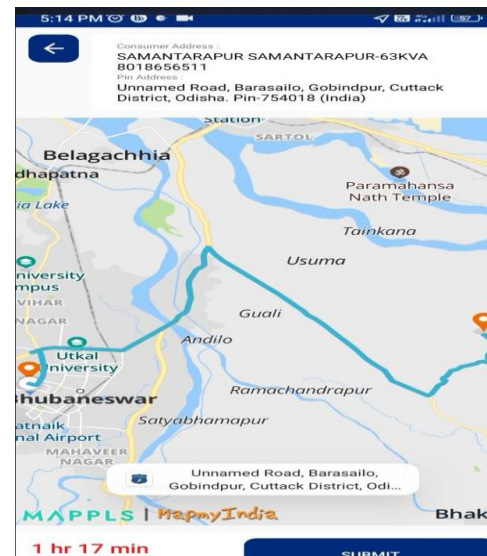
4300723000023 30-07-2023 11:04:06

Phone Number: [redacted] CA: [redacted]

Central Workforce Scheduling Platform

Unified Work force platform to

- Master Field force details
- Task Allocation and Sequence/Schedule
- Tracking of workforce –
 - Track actual work duration, movement duration and idle duration
 - Next day allocation/Same day allocation
 - Live Location tracking
 - Route optimization



GIS, ADMS and Integration

- One network model providing a single view of all work across distribution network operations in real-time.
- Integrated and optimized operational workflows, streamlined across GIS, ADMS, AMI

End Use BDR

- Behavioral demand response campaigns
- Inhouse Built Digital platform
- Part of Tata Power Meter data Management portfolio

Safety Initiatives

- Digitization of Permit to work (PTW) process for Maintenance tasks
- Multiple safety checks and parameters aimed at minimizing the risk of accidents and ensuring adherence to safety protocols.
- ML Based Safety Gear / Equipment Assessment and validation before Issuing the PTW (Helmet/Harness, Neon Tester etc..)

Power Planning and Management - DISCOM

- Load forecast
- Demand supply matching
- Scheduling and Settlement
- Price Forecast

Technology :- Supervised Learning, Python

Asset Management and Predictive Maintenance

Use cases :-

1. Targeted Preventive maintenance for Individual Assets based on Advanced Analytics to predict failure (Machine Learning Models)
2. Monitoring and Alerts Management
3. CAPEX Planning

Previous Anomaly, WO
Historic Measurements, Loads
Asset data /ERP
Manufacturing data and Rules
Criticality and Other Data

SCADA Data
Real Time data

Asset Data

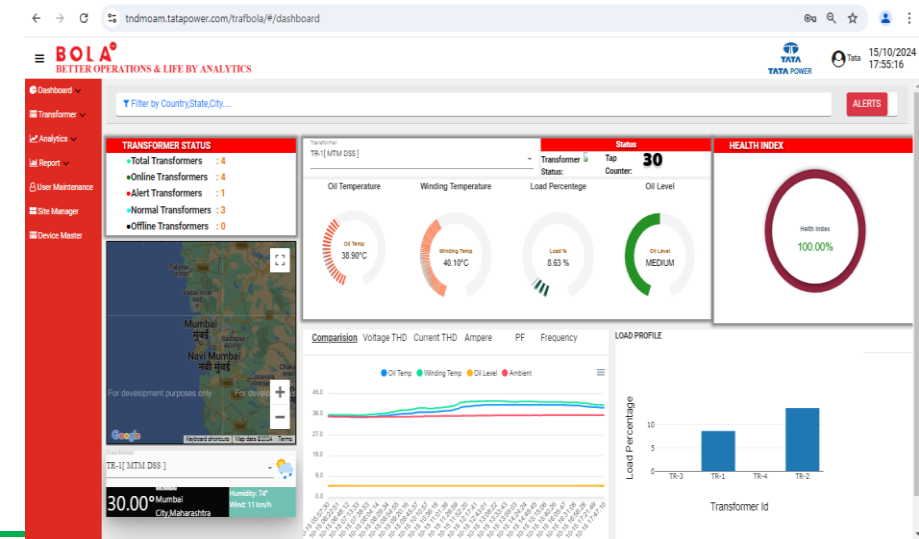
1 Predict failure
Probability

2 Real Time
Monitoring, Alarms

Equipment - Distribution transformer

Use Cases

1. Detect/predict abnormal rise of critical parameters
2. Track high temperature for Non-Thermal-scanning parts
3. Tracking moisture ingress in panels
4. Oil temperature
5. Alarms Notifications



Foundations & Enablers for Transformation

1 Enterprise Service Bus

1. Agility - Build API Library and Deliver with minimal cost
2. Deliver at Scale & Protect Business applications
3. Build Resilience and Queues

2 Public Cloud

1. Scale, Business & Technology Agility
2. Innovation (Industry 4, AI ML, Data Analytics) & Resilience
3. Cost savings

3 Enterprise Data Lake & Big Data

1. Single Golden integrated source of Data at very low cost
2. Foundation for Analytics, Machine learning, Dashboards, and Digital Twin

4 Cyber IT & OT :-

1. Brand reputation
2. IT Security – 24 by 7 Operations center (incl DevSecops)
3. OT Security

5 DR & BCP

1. Brand reputation and Resilience
2. Revenue Protection
3. Customer experience

6 Observability

1. Customer experience and 0/minimal down time
2. Best in class Tech Operations
3. Visibility & Agility

Enablers

Digital Skills :- AI, ML, Data, RPA, Cloud, Cybersecurity

Digital Roadmap Aligned to Business Goals

Employees Adopt Digital and New Ways

Stakeholders Sponsorship

Cross Functional Collaboration

Investments for Long-Term and on Foundations

1 Overall Utilities central data and Visibility

1. Single pane Utilities data for Business (SCADA, LV, Asset repository, Meter data, Historical/Measurements, Faults data, Service requests)
2. Distributed Energy resources visibility including profiles
3. NW investments planning/Capacity Planning, Operations and Power planning needs (Day ahead and Intra day)

Technologies

1. Integrated OT IT Data lake incl DER Data
2. Near real time event processing framework
3. Rule/Condition based Model
4. ML Models
5. Public cloud as foundations

2 Maximize Field Productivity and Safety

1. Field force efficiency
2. Field force – Promise and Customer experience

Technologies

1. SaaS/WFM Platforms with route Optimisation
2. Field force analytics and operations reports

3 Prosumer Business Model

1. P2P trading platforms and settlements
2. Visibility (&Control) for behind the meter generators

Technologies

1. Mobile app & Settlements
2. Block chain in cases of Inter Utilities P2P Trading

4 Customer experience and Self Serve

1. Omni channel experience and Self Serve
2. **Simplify customer engagement process & 1 click**
3. Contact center – RFT and Fewer transfers (FO – Back Office)
4. NPS / Satisfaction, Faster Connection
5. **DPDP – Digital Personal Data Protection**

Technologies

1. Mobile messengers/Whatsapp/App/Social/Missed calls
2. **ML for customer Intent and social sentiments**
3. **Customer single view / lake**
4. **AI/ML Text analytics and Gen AI**
5. **Re-Platform for DPDP Compliance**

5 Asset Management & Predictive Maintenance

1. Transmission and Distribution Asset repository
2. Risk score and Telemetry
3. **Predict failure and Probability**
4. **Scheduled Maintenance based on Probability of failure**

Technologies

1. Asset Repository & GIS with Common Information model
2. **Integration across SAP, SCADA, IOT Devices, Asset repair data**
3. **ML Algorithms**

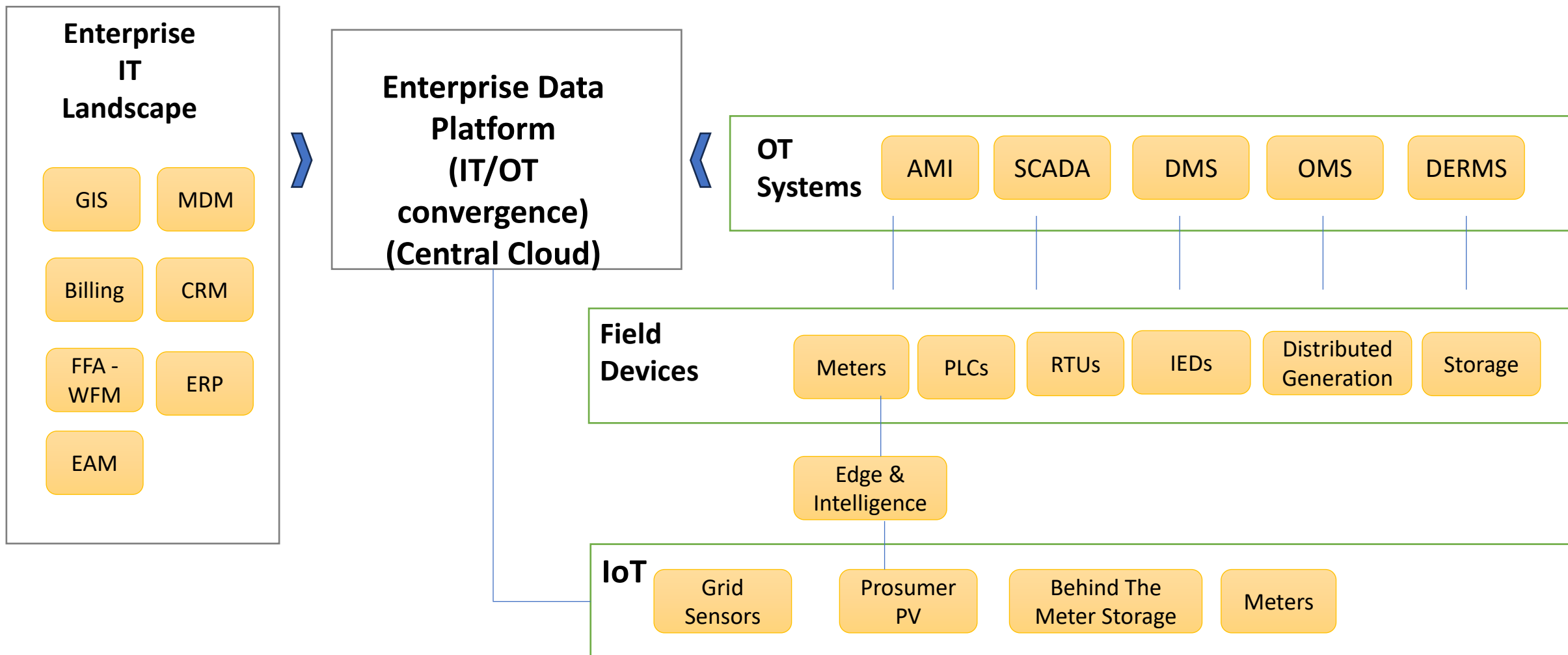
6 Cloud is a Must

1. Big data – AMI/Meter Data , IOT data, DER Data etc.
2. Innovation by AWS, GCP and Azure
3. **AI ML Data innovations focused on only Cloud and Non – existent on Data center**

Technologies

1. Data Lake
2. IOT Data ingestion services (IOT Core ..)
3. AI, ML, ML Ops and Gen AI Services
4. Low TCO compared to Data Center

Data the Foundation



2.0 - Capabilities

Customer Channels

Mobile App

Mobile Messengers

Web

IVR

SMS

Missed Call

Social

Voice & CTI

Data Lake

Data Lake

Asset Data

DER Data

Data Warehouse

Meter Data

Data self Serve

Advanced Analytics/AI/ML

Rules Engine

Data Science- ML

AI – Image, ..

Core ADMS

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Consent Management

Demand Response

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API

ESB

Data

Networks & Infra

Data Center

Cloud

LAN/WAN

OT Assets

IOT/Sensors

Transmission and Distribution assets

AMI

.....

New

High Impact