Smart meters-A paradigm shift in utility approach
Flow of the presentation

- Introduction - Power Sector Scenario
- Smart Grid and Smart Metering
- BIG data Analytics
- MDMS
- Conclusions
Flow of the presentation

- Introduction - Power Sector In INDIA
- Changing priorities of Indian Utilities
- BIG data Analytics
- MDMS
- Conclusions
Changing priorities of electrical utilities

Conducting remote operations
Requires massive automation and control strategy for ensuring precision in real time scenario.

Real time health management of electrical network
Requires development of electric utility specific devices and customised equipment.

Analysis of data generated from network of Smart meters
Challenge to gather and analyse massive data and convert it into useful information by development of smart logics.

Development of artificial intelligence and self operation capability
Requires development of logics and algorithms for enabling devices to operate independently.
Smart Grid Structure:

1. **Head End Server**:
   - Physical Energy Meter and Grid Intelligent Devices
   - The medium through which data of energy meters as well as other smart devices is transmitted.

2. **Communication Channel**:
   - Understanding the vital data received for timely and operational decisions.

3. **Applications**:
   - The logics and analytics on the huge data gathered from smart devices for effective and intelligent system.

   Physical system that records all electrical parameters about consumers load profile and health of power handling equipments.
Advanced metering Infrastructure – Overview

ENDPOINTS

ROUTERS

COLLECTORS

COMMAND CENTRE (HES, MDMS, Application Etc.)
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Data generation sources in an electric utility

Traditional Utilities data on customers and service connection and assets

Smart meter data allowing better insight on customer usage and service quality.

Customer inputs and Complaints data

Socio-demographic information and other publicly available information

Customer interaction channels data over voice, internet, and mobile

Home automation and intelligent home devices data feeds

New technologies requiring additional monitoring – Electric Vehicles, Photo Voltaic panels / Solar Generation, Wind Generation, City Lighting monitoring, micro-grids integration
Role of Big data analytics in electric utility

- Power portfolio management
- Network optimization and analytics
- Consumer demand behavior study
- Data base integration and quality improvement
- Load forecasting
- Predictive asset maintenance
- Revenue management and discipline
Areas of implementation of big data analytics in electric utility

1. **Peak Demand and Electricity Consumption**
   - AMI
   - Pricing programs and Customer Devices
   - Direct load control

2. **Energy Efficiency in distribution Systems**
   - Voltage optimisation
   - Conservation voltage reduction
   - Line losses

3. **Operations and Maintenance Savings from advanced Metering**
   - Meter Reading
   - Service Changes
   - Outage Management

4. **Operations and Maintenance savings from Distribution Automation**
   - Automated and remote operations
   - Operational efficiency

5. **Distribution System Reliability**
   - Feeder switching
   - Monitoring and health sensors

6. **Transmission System Operational and Reliability**
   - Application of technology for wide area monitoring, visualization and control
Expected outcome of big data analytic in electric utility

01. Anticipate failures of distribution assets
02. Improve balance of generation/input and demand at all times
03. Improve energy planning forecasts to decrease energy costs on markets
04. Supporting optimized Low Voltage distribution network operation
05. Enable optimization and control of delocalized generation
06. Allowing Utilities to identify and reduce losses
07. Structure effective Energy Saving policies and campaigns
08. Improve Customer Service Quality
09. Enable better way of consuming, proposing Energy Use advisory

TATA POWER-DDL

with you Non-Stop
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MDMS-Expectations

- Energy Auditing
- OMS/DA
- Demand Forecast
- Volt - Var Control
- Call centre
- Network Planning
- Tamper Detection
- Meter Reading /Billing
- LOAD MGMT.
- ASSET MGMT.
MDM – in middle of every need!
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Smart Grid infrastructure “the way of Life”

AT&C
- Instant reporting of Losses i.e. tampering and theft of electricity
- Billing efficiency will increased
- Accurate Energy auditing

IT-OT
- SCADA, OMS, DMS
- GIS, Network Information System, Business Intelligence
- Real time information about equipment health
- Instant reporting of fault location

Business Needs
- Reliable, competitive and sustainable power
- Asset Management
- Customer satisfaction enhancement
- Performance Assurance i.e. Statutory compliance
Thank You

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