Smart/Intelligent Grid Development and Deployment in Thailand (Smart Thai)

Smart Thai Corporate Exchange: Smart Grid ICT

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Planning and System Development Meeting Room
Orga Systems

Smart Grid ICT: Corporate Exchange Program
Bangkok July 17th and 18th
Key Challenge in Developing the Smart Grid
“Design with the end in mind”

The emerging smart grid involves a multitude of components such that extracting the best value from your investment means taking a holistic approach to data and information management to measure, control, and optimize the business for the utility of the future.
Scottish Power LCNF for Liverpool

- Densely populated, inner city area of Liverpool, around 10,000 customers
- Reduce carbon footprint via active network management
- Facilitate connection of distributed generation
- Potential for Electric Vehicles (via funding through Plugged in Places)
- Complex, interconnected network (closed rings)

- Need robust and scalable information technology to facilitate trial
Smart IT is...

- Software, services, and processes that optimize smart grid enabled use cases
- Interoperability framework for enterprise data management and systems integration

Smart IT Outcomes

- Reduce time to design
- Reduce time to market
- Accelerate business benefits
- Reduce total cost of ownership
- Flexibility and future-proof
- Incremental capability enablement
- Standards and security
- Pilot & prototype solutions

Utility IT Reference Architecture

- Customers
- INDE Core
- Co-Location Core
- Smart IT Data Core
- Operations Systems Core
- Security Layer
- Real-time, Operations, and Complex Event Processing
- Utility Communication Network
- Smart Grid Data Sources
- Regulators

Advanced Technical/Operational Data Analytics and Visualization

Third-Party Services Integration

Optimized Meter to Cash

Advanced Asset Management

Optimized DR/DG Program Management

Optimized Outage & Trouble Order Management

Optimized Security and Network Management

Optimized Grid Operations With DMS
Manage the Intelligent Network

Distributed Generation
Demand Response
Automation and Self Healing
Predictive Monitoring
Network Quality
Operational Information
Reference Architecture

The understanding of business processes is essential to answer the key questions necessary to deliver on value of analytics.
We have cataloged 200+ analytic calculations with our clients and labs R&D initiatives; clearly this catalog will grow as the Smart Grid evolves and matures.

**Functional categories of smart grid analytics**

- Electrical and device states (traditional, renewables and DER)
- Power quality
- Reliability and operational effectiveness (system performance)
- Asset health and stress (asset management)
- Asset utilization (utilization optimization)
- Customer behavior (especially Demand Response)

Accenture has deep expertise across the functional areas of smart grid analytics.

Understanding the **data classes** (above) involved in analytical systems is critical to matching **latency** and **granularity** of data to capabilities – a key principle in the INDE data management approach.
Smart Grid Enterprise Situational Awareness

### Business Operations
- Billing and CRM
- Asset Management Applications
- Work, Resource & Field Management Applications
- Procurement/Equip Deployment and Management
- Load Forecast & Settlement
- Enterprise Data Management & Business Intelligence

### INDE & INCIM
- NERC/CIP
- IEC 61968/70
- IEC 60870-6, TASE.2
- IEC 61850/DNP3
- IEEE C37.118
- Zigbee/SEP
- HomePlug
- NMS
- Help Desk
- Systems Operations Visualization
- VPP and Demand Response
- GIS
- OMS
- OpenHAN
- DMS
- ANSIC12, IPv6

### Intelligent Network Data Enterprise
- Complex Event Processing
- Integrated Data Architecture
- Application Integration
- Analytics & Visualization

### Intelligent Network Communications & Infrastructure Management
- Data Collection Engines
- Comms Infrastructure
- Device/Firmware Management
- Network Comms Management

### Infrastructure Components
- Substation Automation
- Dist Automation
- Dist Energy Resources
- Renewable Energy Resources
- Smart Meters
- HAN / Energy Mgt
- Smart Buildings
- Plug in Electric Vehicle

### Existing (SOA) Enterprise/Legacy Integration Environment

### T&D Operations Control Centers
- Systems Operations Visualization
- GIS
- OMS
- DMS

### Consumer Operations
- Customer Strategy & Experience
- DSM Marketing & Sales
- DSM Product, Pricing & Svs Development
- Customer Care Operations
- Multi-Channel Management
- Consumer Technology and Support
- Performance & Compliance Management
- Customer Insight & Analytics
- Quality and Performance Management
- Operational Transition Management
Communications and Infrastructure Management

Focus is on collecting “IT centric” events from lower-level systems.

Intelligent Network Communications & Infrastructure Management (OSS Manager of Managers)

- OMS
- DMS
- Trouble Ticketing

Head-end / EMS
- Data Collector / Concentrator
- Video Surveillance
- Security Systems
- Telecom Management Systems
- AMI Head-end & MDMS
- Mobile System
- IT Management Systems

WAN
- Private and Managed Service WAN

Back-haul
- Private Wired & Wireless Backhaul
- Cellular Networks

LAN
- Gateway LAN
- Gateway
- Sub-station LAN
- IEDs
- Process Bus
- Switchyard Equipment

Devices
- IEDs
- Distribution Substations
- Distribution Lines
- Distributed Generator
- Home / Customer
- Mobile IT
- Data Center

Domains
- Transmission Substations
- Distribution Substations
- Cellular Networks
- Data Center LAN
- Servers and Infrastructure

Focus is on collecting “IT centric” events from lower-level systems.
Thank you!