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Smart Grid as a Disruptive Technology — Convergence in the Retail, Telco and Utility Industries

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Smart Grid as a Forcing Function

- Forcing function — a behavior shaping constraint
- Smart grid — specific desired benefits of the digitization of the electric grid from generation to end use
  - Replacing 100-year-old infrastructure (replacing older analog technology with new digital technology)
  - Deriving benefits enabled by digitization, such as increased variety and volume of data capture, self-healing transmission and distribution operating systems, enhanced consumer benefits and options, new rating algorithms, and system efficiencies
- Smart Metering – 15 minute reads – Advent of Big Data
  - From one read per month per meter to 2,886 per month per meter or 34,632 per year per meter
  - Thirty-four or more billion reads per year versus 12 million reads per year for a one-million meter utility
Essence of Smart Grid

Generation

Transmission

Distribution

Retail

Make a Market
Assure Transmission Access

ISO, IMO

Customer Data Clearing

Attribute
Cost and Revenue

Digital Energy Information Highway

Generation Stack

End-Use Profile

Renewable and Clean Energy

Distributed Generation

Solar, Wind Battery, V2G
Bambi Meets Godzilla

• Forcing function — a behavior shaping constraint

• The availability of behind the meter data combined with the volume of data to be obtained (retained?) combined with new retail options for the consumer and real time billing augurs:
  • Advent of the “information utility”
  • Potential for fruitful alliances with telecommunications
  • Entrance of new behind the meter retail firms offering consumer products and services

• Since 2010 the number of questions about the retail energy utility business from non-utility firms (retail, telecommunications, oil & gas, etc.) have expanded exponentially!
Smart Grid is Reshaping the Utility Business Model – OT meets IT

- Natural separation in the energy utility environment of information and operating technologies is eroding as the grid is digitized and utilities drive for process efficiencies.

- As OT becomes digitized and increasingly network-dependent, IT discipline and practices are inexorably drawn into the OT environment.

- The convergence of IT and OT is not a technical challenge, but it poses organizational and political issues that are difficult to resolve within the traditional utility business model, such as the siloed environment.
CIO Dilemma: Multiple Technology Domains

How to manage technology interaction (standards, security, governance) outside IT and outside utility enterprise
The Retail Dilemma

Who will be the retailer of energy a decade from now?

- **PURC* survey** of utility executives and commission staff (30 to 60 years of age)
  - 60% would not buy electricity from a major telecommunications carrier.
  - 26% expect to buy electricity from a major non-utility retailer.

- **PURC* survey** of MBA students (23 to 33 years of age)
  - 76% would buy electricity from a major telecommunications carrier.
  - 40% expect to buy electricity from a major non-utility retailer.

- **So what?**
  - Reveals something about the pace of change in generational preferences
  - Reveals something about the perception of the sensitivity of the traditional utility to consumer wants, needs and preferences

*Public Utility Research Center, Warrington College of Business Administration, University of Florida*
New Need Emerges
"The Information Utility"

Commodity Value Chain
Business processes that enable companies to procure energy and sell it to consumers

Asset Value Chain
Business processes that enable companies to develop, operate and maintain the assets needed to deliver energy to consumers

Energy Utility Value Chain

Business Model: Competitive energy retail
Strategy: Grow the business
Competencies: Customer mgmt., commodity mgmt., marketing and brand mgmt.

Deregulation
Business Model: Regulated energy delivery
Strategy: Run the business
Competencies: Asset mgmt., regulatory mgmt., work mgmt., cost mgmt.

Energy Information Value Chain
Business Model: "Information utility"
Strategy: Transform the business
Competencies: IT services in cloud, Web 2.0

Energy Sustainability Consumerization
Convergence: What Telco Brings to the Table

• Telecoms have
  - deep experience with real-time billing and high-volume data management.
  - become customer-centric and earned customer loyalty
  - their transformation was more revolution than evolution

• Smart Grid may be as close as the energy utility have come to “bypass” in the telecom industry

• The Question: Are the major telecoms allies, competitors or business partners?
Questions / Concerns??