# Business Models for Smart Grid

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# Business Model as defined in Investopedia

- A **business model** is the plan implemented by a company to generate revenue and make a profit from operations. The model includes the components and functions of the business, as well as the revenues it generates and the expenses it incurs.

# What is a Business Model – Michael Lewis

- Michael Lewis said that "All it really means is how you **planned** to make money"
- To make a simple point about the dot.com bubble. The term, he says dismissively, was "central to the Internet boom; it glorified all manner of half-baked plans …
- The "business model" for Microsoft, for instance, was to sell software for 120 bucks a pop that cost fifty cents to manufacture …
- The business model of most Internet companies was to attract huge crowds of people to a Web site, and then sell others the chance to advertise products to the crowds. It was still not clear that the model made sense." Well, maybe not then.

# What is a Business Model – Peter Drucker

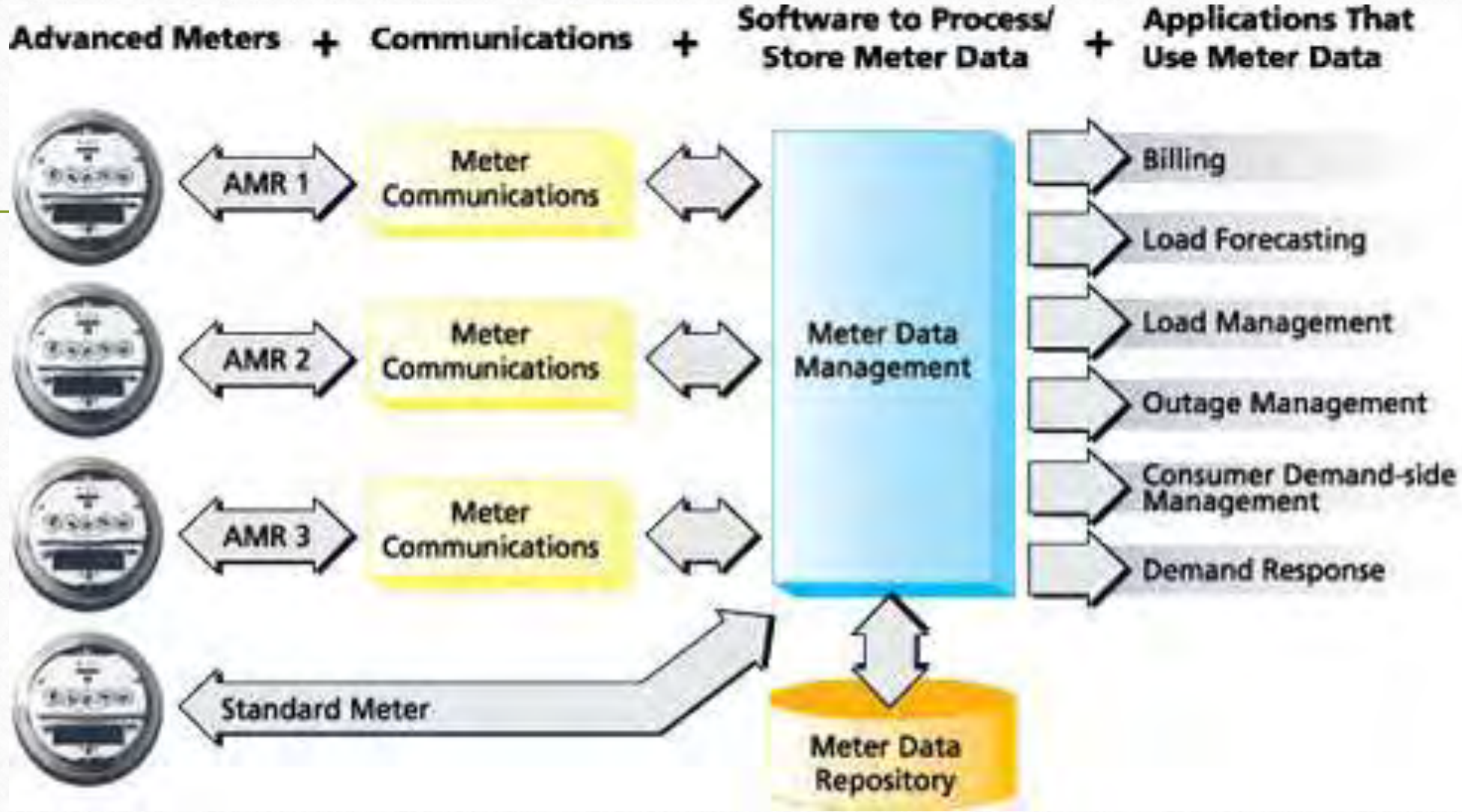
- Peter Drucker defined the term — "assumptions about what a company gets paid for".
- Drucker's theory of the business was a set of assumptions about what a business will and won't do…
- A good business model answers Peter Drucker's age-old questions, 'Who is the customer? And what does the customer value?'

# Business models for Distribution Utilities for Smart Grid components

- Installation of Distribution SCADA (includes Outage Management function/Energy Audit function)
- Installation of Advanced Metering Infrastructure (AMI) (i.e Smart Meters, Communication, Hardware and Software).
- Installation of Remote Transformer Monitoring
- Installation of Fault Locator in a feeder
- Rooftop solar PV encouragement
- Tariff Structuring (incentives for demand response)

# Distribution SCADA

# AMI

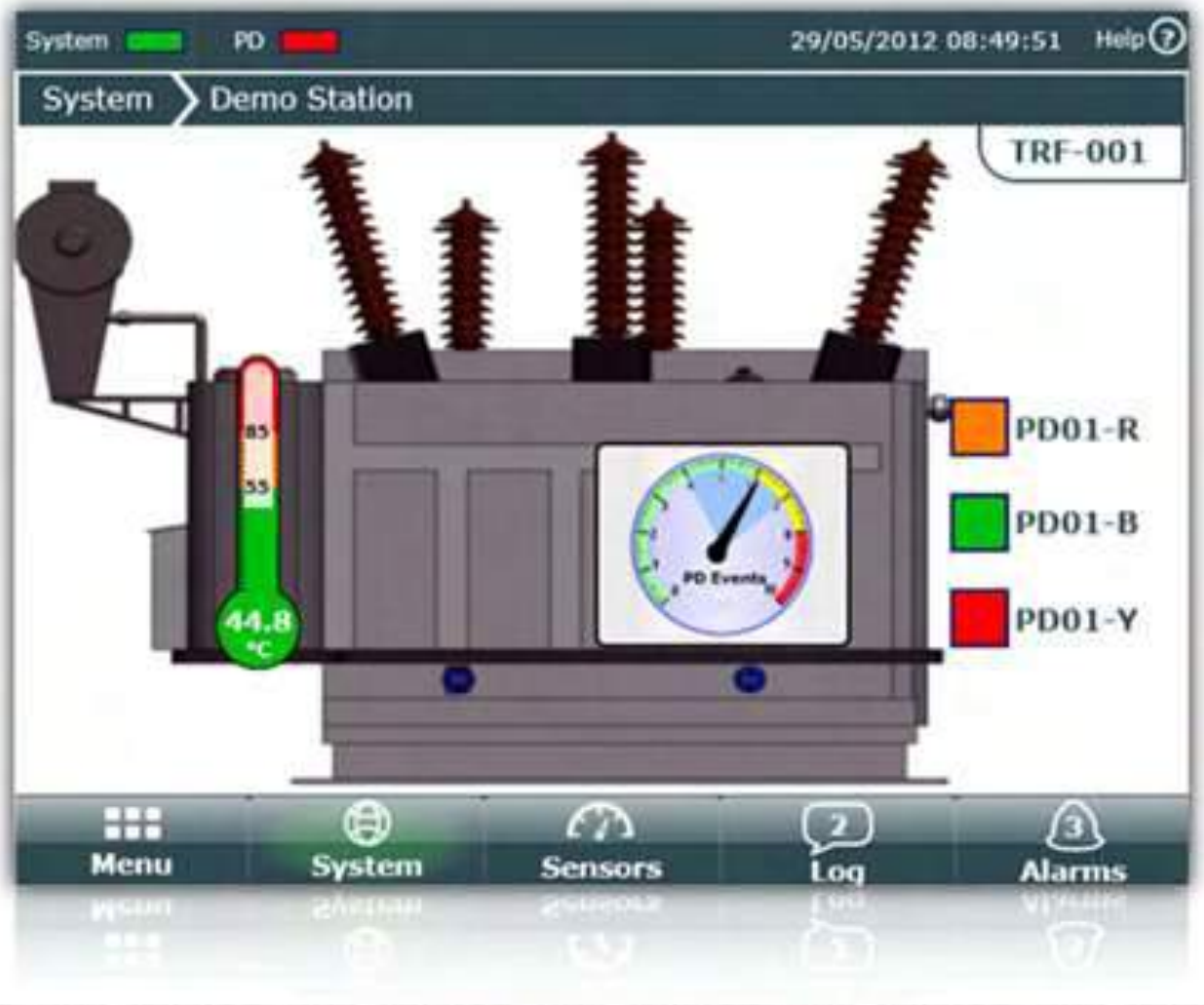

Advanced Meters + Communications + Software to Process/ Store Meter Data + Applications That Use Meter Data
AMR 1
AMR 2
AMR 3
Standard Meter
Meter Communications
Meter Communications
Meter Communications
Meter Data Management
Meter Data Repository
Billing
Load Forecasting
Load Management
Outage Management
Consumer Demand-side Management
Demand Response

# Remote Transformer Monitoring Unit

- Measures Voltage, Energy, Current and Temperature.

**Applications**

- Asset Management and Condition Monitoring Preventive Maintenance Recognition
- Demand Response Assistance
- Distributed Generation Monitoring (i.e., bi-directional energy monitoring)
- Transformer Under/Over-sizing Recognition (e.g., Electric Vehicle charging station impacts,etc…)



# Cable Fault Locator

A high voltage impulse is transmitted down the cable to cause the fault to arc. The arcing fault is then pinpointed using an appropriate impulse detector.

# Rooftop solar PV

# Benefits to the Distribution Utility in the Indian context

- Savings in AT&C losses
- Handling of variability of intermittent type of Renewable Energy Sources.
- Reduction of downtime due to outages in distribution system.
- Reduced burning of distribution transformers.
- Optimum utilization of transmission and distribution assets.
- Savings in sub-transmission and distribution system upgrades.
- Reduction in electricity bills of consumers.

# Benefits to the customer in the Indian context

- Reduction in electricity bills of consumers.
- Improved reliability of service.
- Improved quality of supply.

# Objective of the Business model for the State Distribution Utility

- Mutual benefit for the Distribution Utility and the consumer.
- For upfront money, technology company can provide the same.
- Useful to have the technology company to also do the billing and collection along with the maintenance of the Distribution SCADA and AMI.

# Business model for the Distribution Utility for Distribution SCADA and AMI

- **Costs** :
- Installation of Distribution SCADA (includes Outage Management function/Energy Audit function)
- Installation of Advanced Metering Infrastructure (AMI) (i.e Smart Meters, Communication, Hardware and Software).
- **Benefits** :
- Savings in AT&C losses
- Reduction of downtime due to outages in distribution system, therefore more revenue.
- Optimum utilization of transmission and distribution assets.

# Savings in AT&C losses – Test case UP

- 93,052 million units consumption for 2015-16.
- AT&C losses – 27%
- Saving of 1% losses means saving of 930 million units in a year.
- Average cost of purchase – About Rs. 4 per unit.
- Savings in Rupees – Rs. 372 crores.
- Cost of one Distribution SCADA – Rs. 5 crores
- Cost of Distribution SCADA for 4 Distribution Utilities – RS. 20 crores

# Savings in AT&C losses – Test case UP

- Number of consumers registered – About 1 crore
- Cost of AMI – Say about Rs. 2000 per unit
- Total cost of AMI meters – Rs. 2000 crores
- Cost recovery for 1% savings in AT&C losses for 6 years - Rs. 2220 crores.
- If 2% savings, cost recovery in 3 years, if 3% savings cost recovery in 2 years, if 6 % savings, cost recovery in 1 year.
- Models : Technology company bears this initial cost, and recovers this through demonstrated savings on a monthly basis; then continued savings for the Distribution company.

# Other Business Models for Smart Grid

- Installation of Remote Transformer Monitoring
- Installation of Fault Locator in a feeder
- Rooftop solar PV encouragement
- Tariff Structuring (incentives for demand response)

# LIST OF BENEFITS AS PER EPRI COST BENEFIT ANALYSIS (2010)

- Optimized Generator Operation
- Reduced generation and transmission and distribution capacity investment
- Reduced Ancillary cost
- Reduced Congestion Cost
- Reduced equipment failure
- Reduced meter reading cost

# LIST OF BENEFITS AS PER EPRI COST BENEFIT ANALYSIS (2010)

- Reduced electricity theft
- Reduced losses
- Reduced outages
- Reduced fossil fuel usage
- Reduced CO2, SOx, NOx emissions
- Reduced Sags and Swells

# Thank You