How Big Data is Changing Our Transmission System

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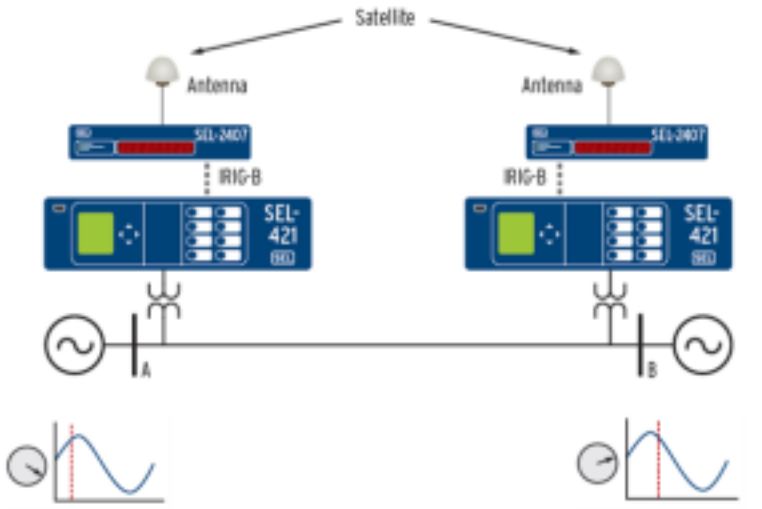
Top 10 Smart Grid R&D Challenges

1. Standards & Interoperability
2. Communications Technology
3. Energy Mgmt Architecture & Integration
4. Security & Privacy
5. Renewable & DER Integration
6. **Data Mgmt, Analysis & Visualization** 
7. Grid Management & Planning (Bulk)
8. Smart Grid Cost Benefit Analysis
9. Customer Integration Strategies
10. Advanced Technology Assessments

Challenge: *Turning Data into Value*

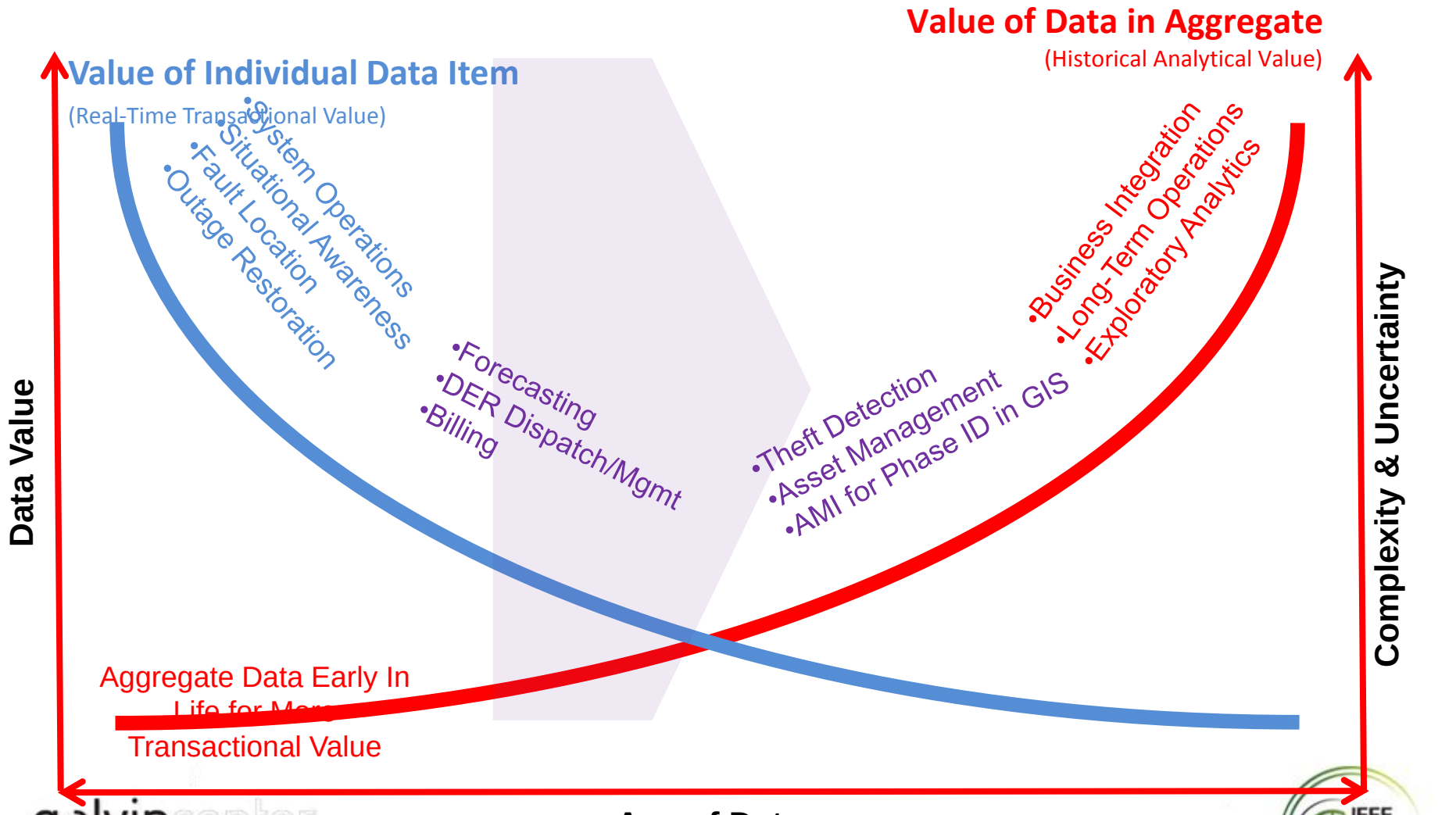
Our industry is creating more and more data

- No. Of PMU's installed has doubled in the past 12 months
- Generating Terabytes of data
- Transitioning from Implementation to Analysis



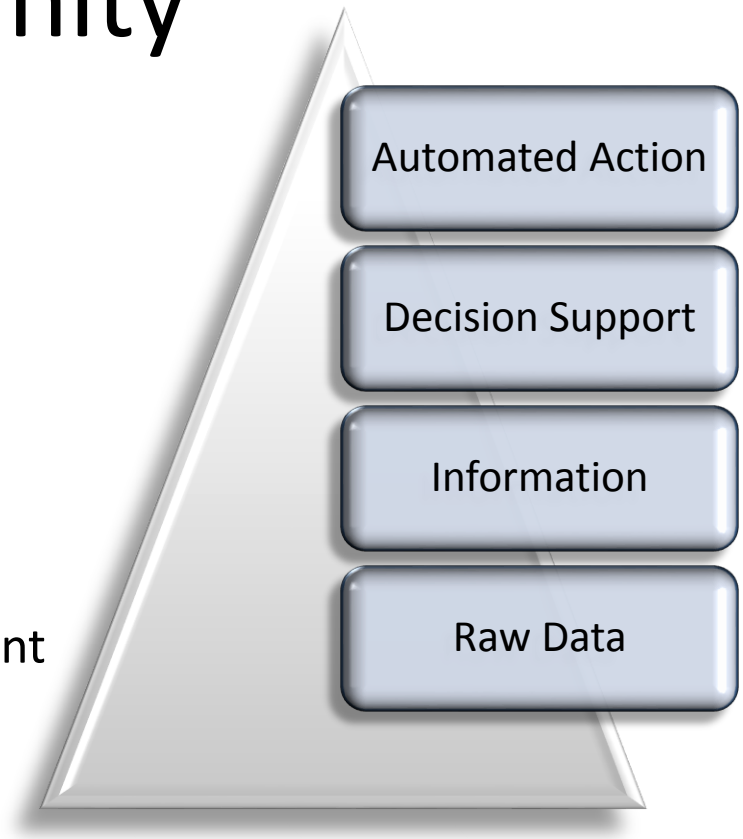
Management (Optimization) of the Grid = Management of Data

Data Value Throughout it's Lifetime



The Opportunity

- **Leverage Smart Grid Investments** that are Producing High-Quality Data
- **Integrated Data Sources** across different organizational groups
- **Apply advanced data mining algorithms**
- **Demonstrate the data analytics applications**
  - Planning Operation, and Asset Management
- **Solidify your 5 Year Roadmap**
  - Global collaboration
  - Leverage Common Data sets
  - Leverage Common Applications



Improve Reliability – Increase Operational Efficiencies

Examples of Data Analytics

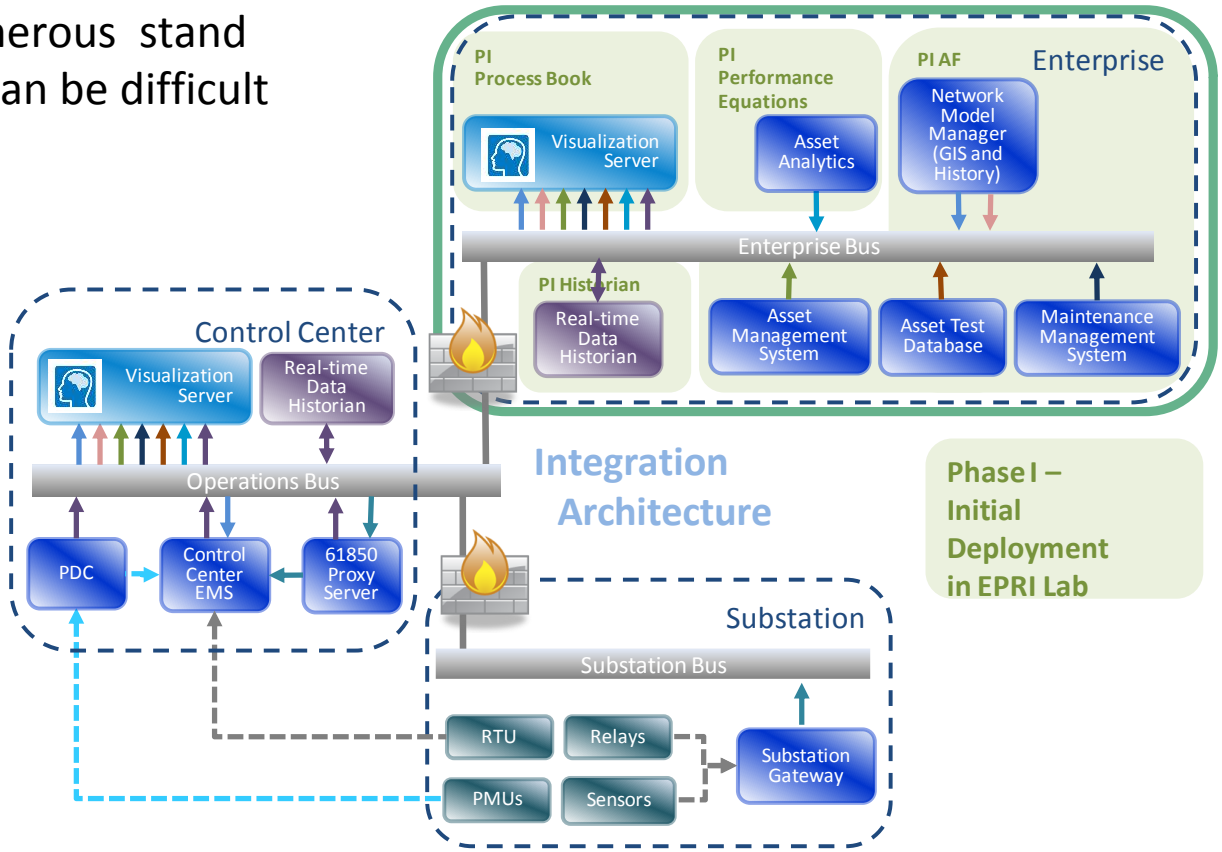
- Technologies, services and processes that enable utilities to transform data into **actionable insights**.

- Examples:
  - **"Number crunching"** applications
  - **Combinations** of related data items
  - **Recognition** of patterns
  - **Trending and projection**

Field Data for Asset Management

Problem: Utilities have numerous stand alone data sources that can be difficult to access and use

A Solution: Use CIM to link and integrate these data sources.



Object models provide the basis for transferable analytics

Connectivity & *the* Grid

- Transforming the grid from a traditional one-way power flow to one that enables intelligent two-way flow of power and information, connectivity will be paramount.
- Grid modernization investments must respond to changing supply and demand profiles introduced by new technologies that depend on an increased level of connectivity.




Thank You!

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