

Leveraging CIM for Electrical, Water and Wastewater Asset Management at JEA

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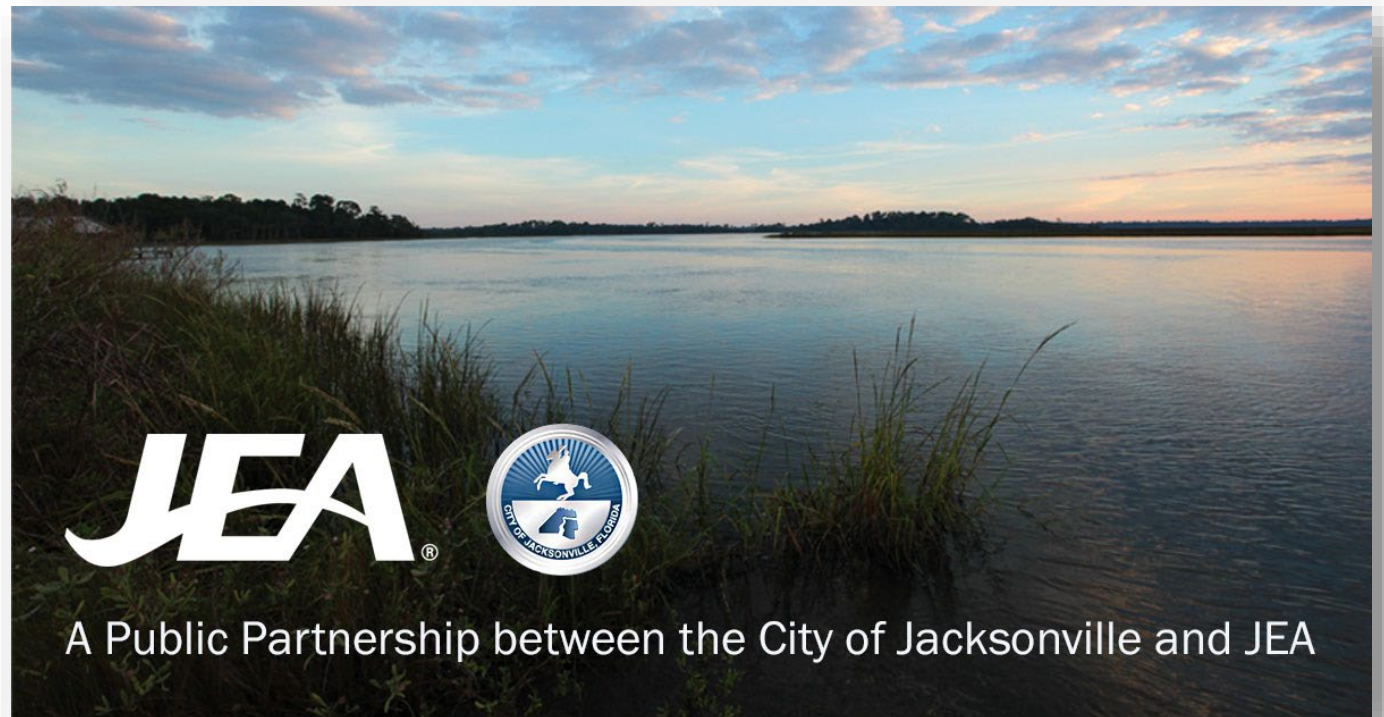


- JEA Overview
- Project Overview and Background
- Reference Architecture
- Need For Change
- Systems Vision
 - Integration / SOA:
 - Analytics :
 - EIM
 - Edge Computing (IoT)
 - Mobile / Composite applications

JEA Overview

- Not-For-Profit, Community-Owned Utility
- Located in Jacksonville, Florida
- Services:
 - Electric
 - Water & Waste Water
 - Reclaimed Water
 - Chilled Water
- Estimated Customers:
 - 458,000 electric
 - 341,000 water
 - 264,000 sewer

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A Public Partnership between the City of Jacksonville and JEA

- Electric

- Generation, transmission & distribution
 - 5 generating plants
 - > 745 circuit miles of transmission lines
 - > 6,760 miles of distribution lines.
- Purchases solar energy
 - Including Jacksonville Solar
100-acre / 200,000 panels.
- Sold 14.5 million MWh in 2016.

- Water and Sewer Systems


- Water System
 - 134 artesian wells into Floridan aquifer.
 - 38 water treatment plants
 - > 4,449 miles of water lines.
- Wastewater System
 - > 3,900 miles of wastewater collection lines
 - 11 wastewater treatment plants.
- Reclaimed Water System
 - Highly-treated water for irrigation.
 - 227 miles of lines / 8,361 customers
 - St. Johns River water quality improvement
 - Reduced demand on Floridan aquifer.
- Sold 36.3 million kgals in 2016 FY
 - Water & sewer

Project Overview and Background

- EIM project; covers data in motion, data at rest
- Focus on Assets (initial)
- Leverage Standards
 - Information, processes, information exchange : IEC TC57
 - Strategy, Processes, Organization : ISO 55000 / IAM

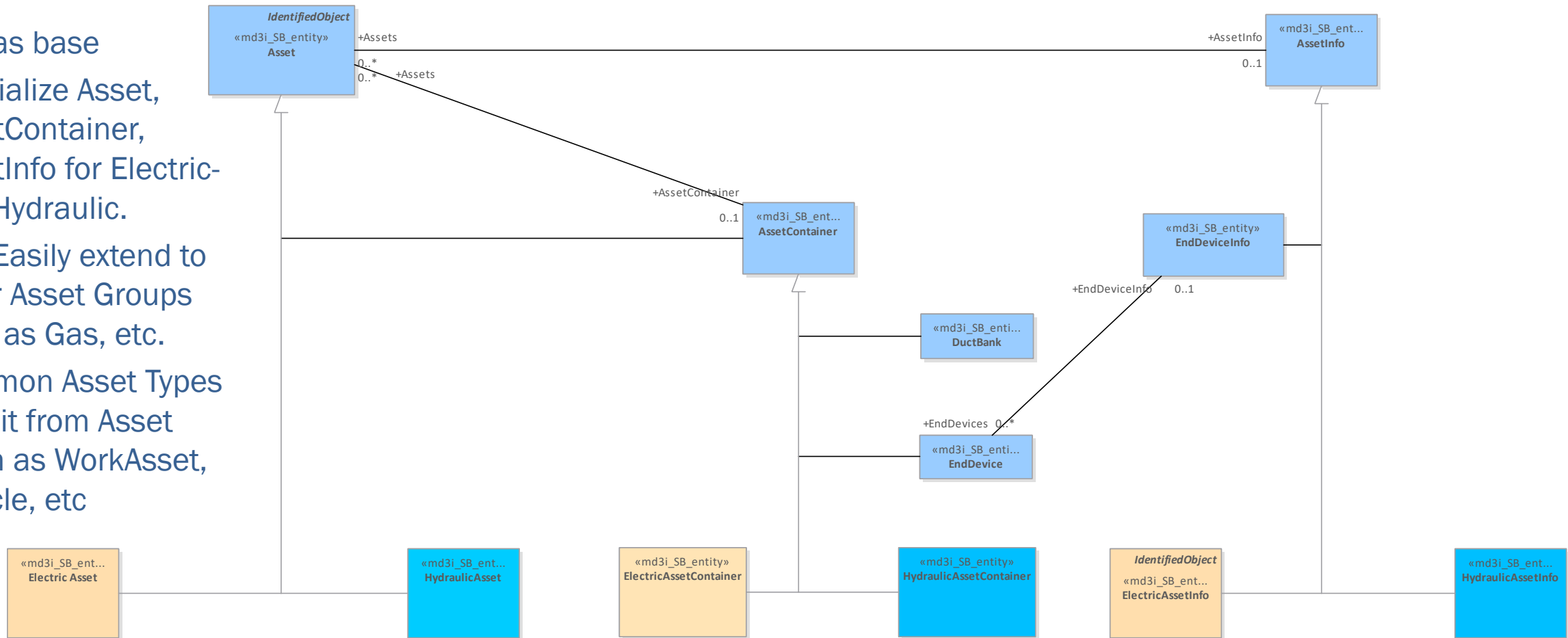


Reference Architecture

- Address
 - SOA and Integration (Data in Motion)
 - Information and Analytics (Data at Rest)
- JIM (JEA Information Model) 
 - Based on IEC TC57 CIM 
 - Modify and extend
 - include Water and Wastewater Asset, Equipment, Topology, Measurement
 - Anticipate additional reference models in future
 - e.g. SID, HRXML, OAG

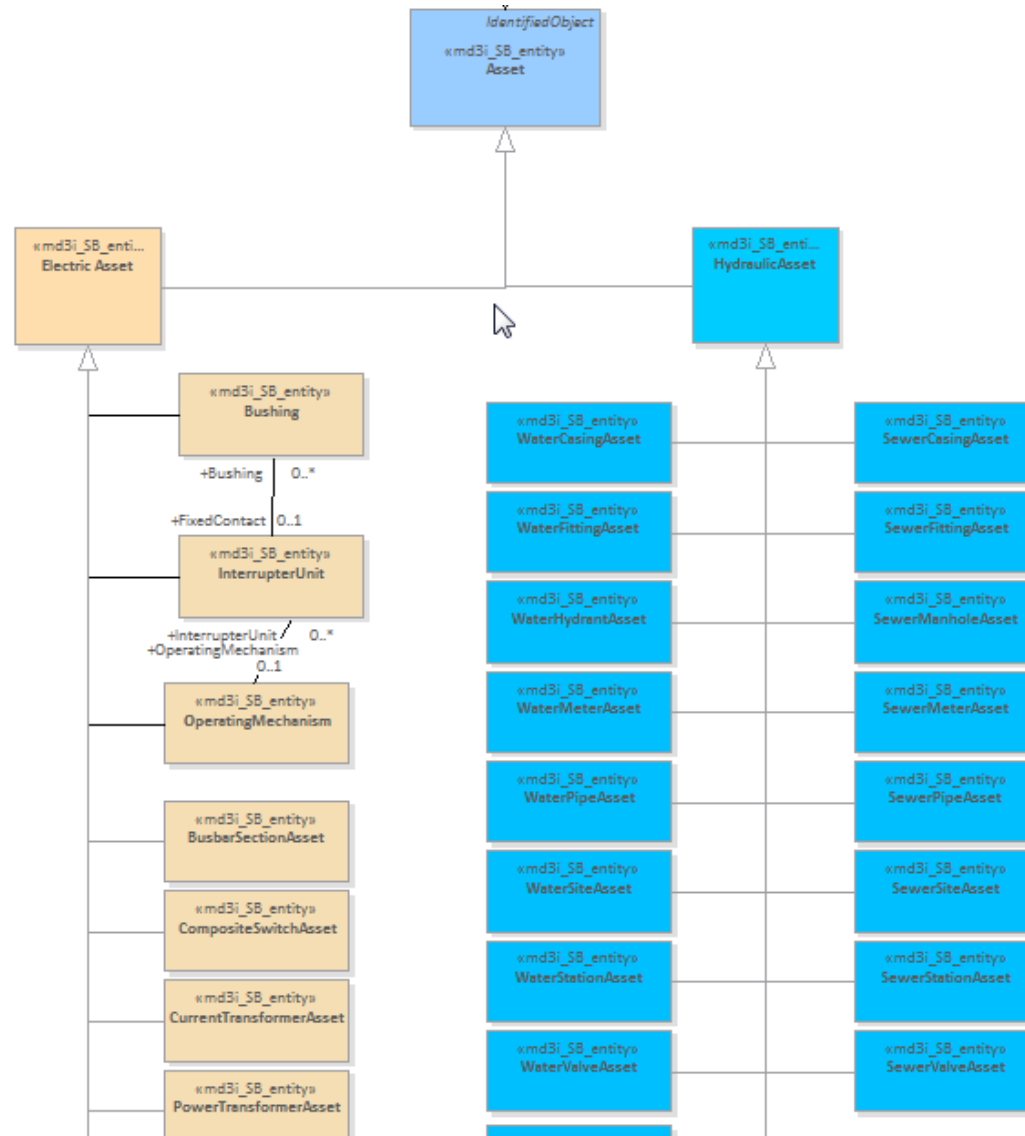
JEA JIM - Core Asset Extensions

- CIM as base
- Specialize Asset, AssetContainer, AssetInfo for Electric and Hydraulic.
- Can Easily extend to other Asset Groups such as Gas, etc.
- Common Asset Types inherit from Asset (such as WorkAsset, Vehicle, etc)



JEA JIM - Core Asset Extensions

- Extend to include specializations of ElectricAsset

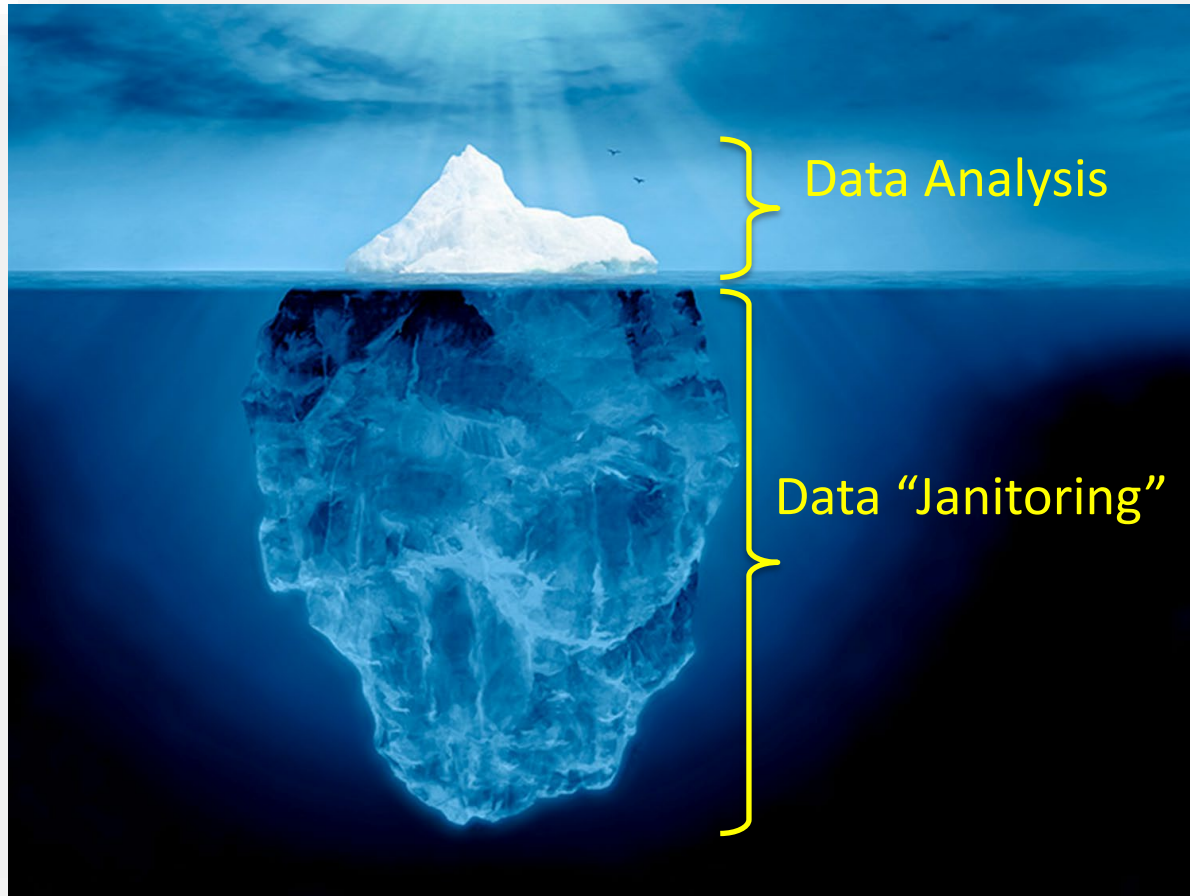


- Includes a set of Water- and Sewer Assets
- Attributes derived from existing systems meta data

Need For Change



Turn the Analytics Paradigm Around for Assets



Current State:

- 80% Data “Janitorialing” / 20% Analysis

Future State:

- 10% Data Discovery / 90% Analysis
- Connect current data with external data
- Predictive analytics

What will change

We avoid Accidental Architectures in our Power network...

... we should avoid accidental architectures in our Integration & Data management solutions!

Expensive to maintain

Hard to Adapt / Scale

Functionally Deficient

Treating Data As an Asset

*“It’s the **data** that makes the business successful. This requires a cultural mindset change that focuses on data collection, movement, storage and dissemination, not the software”.*

Enterprise Information Management is the program that defines data governance, collection, movement, storage and dissemination. This is how we will create the Golden Record.

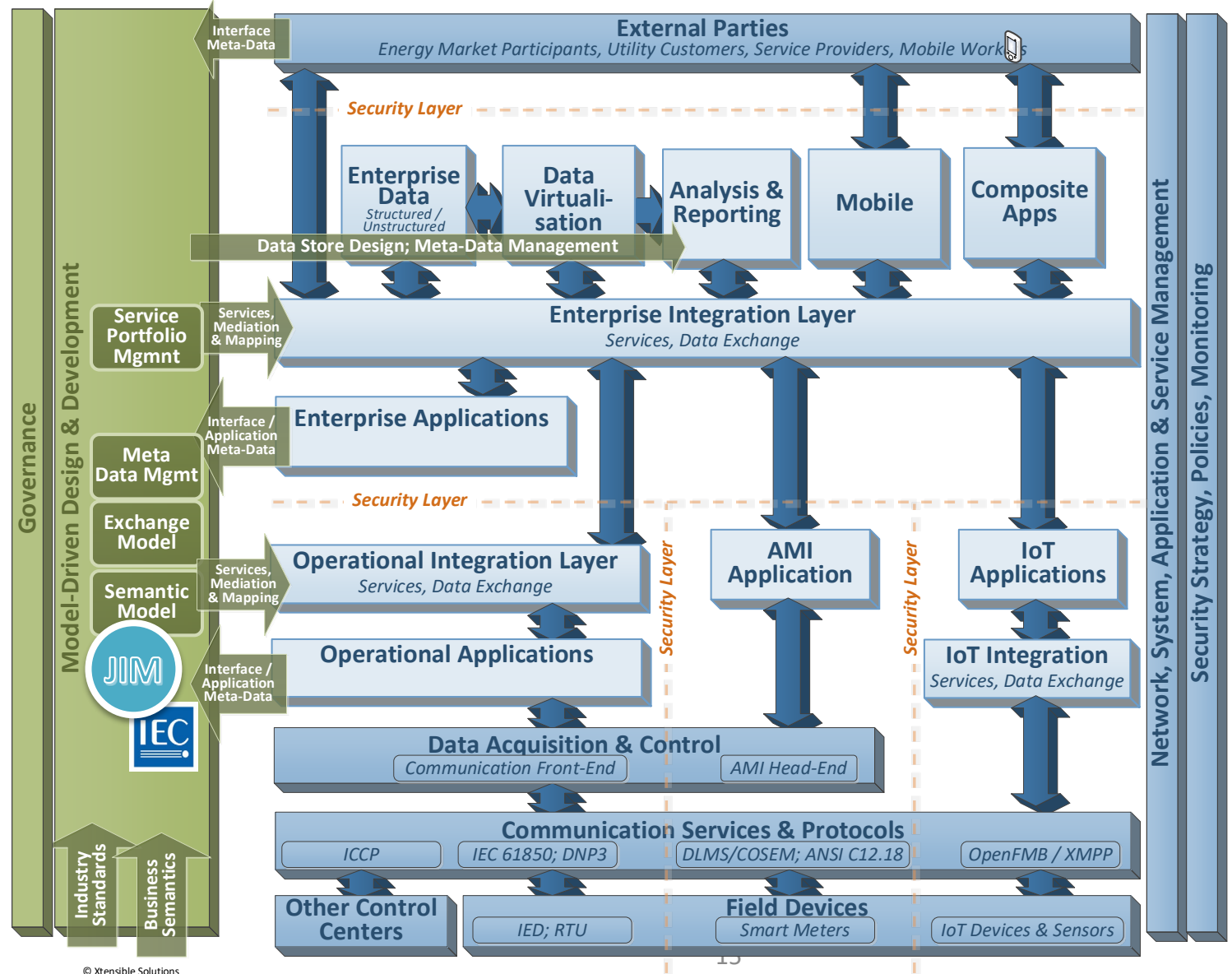


Systems Vision



Systems Vision | System Reference Architecture

- Service Orientated Architecture
 - Layered approach - Guidance for project-specific designs.
 - Loose coupling - Between applications & component layers
- IT/OT Integration
 - Information Technology (IT) & Operation Technology (OT) integration
- Analytics
 - Relational & NoSQL (Big Data)
- Edge Devices / IoT
- Composite Apps
- Mobile



Systems Vision: Integration / SOA

- JIM-based canonical APIs / services, APIs as assets
- Focus on maximizing re-use
- Loose coupling & change isolation
- Event-driven (“information at the speed of business”)
- Master data management “baked in” to design



Systems Vision: Analytics

- Unified view of enterprise data, based on JIM
- Provision data to all consumers
 - Data analysts & scientists, Citizen data analysts, Packaged Analytic Applications
- Transcends storage technologies
 - Relational, NoSQL (“big data”), Time-series
- Designed for re-use
- Support all information needs
- Near-zero data latency
- Data lineage, Meta-data
- Data access - based on organizational role & data security classification



Systems Vision: Edge Computing (IoT)

- Interfaces based on JIM
- Follow OpenFMB approach
- Collaboration with OpenFMB on new JEA use cases
- PoC just kicked off



Discussion – Q&A

