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Leveraging CIM to Enable Utility Data Analytics

CIM Users Group Fall 2012 Meeting


GET ALL THE INFORMATION YOU CAN, WE'LL THINK OF A USE FOR IT LATER.

Presentation Outline

- Utility analytics business drivers overview
- Key elements of a typical Utility analytics platform
- Problems with analytics platforms and how a CIM helps

Utility Analytic Business Drivers

The "Smart" in Smart Grid is all about **transforming data into actionable intelligence**

- "The Smart Grid business case is empty without being able to **identify and use data** to improve customer experience, utility operations and advanced power management"
- The "smart" in smart grid comes from the ability to generate, manage, and **analyze a wide range of new information** about the network and its users. Information technology is the key element in linking new data sources, analyzing patterns, and enabling real-time responses.

(Pike Research)

Utility data analytics enable this transformation into actionable intelligence

- Software platforms and/or tools that transform data into information that can be acted upon proactively or reactively by:
  - automatic controls,
  - decision support systems, and/or
  - performance indicators that guide operations or planning.

Utility Analytics Platform Architecture

Key Elements

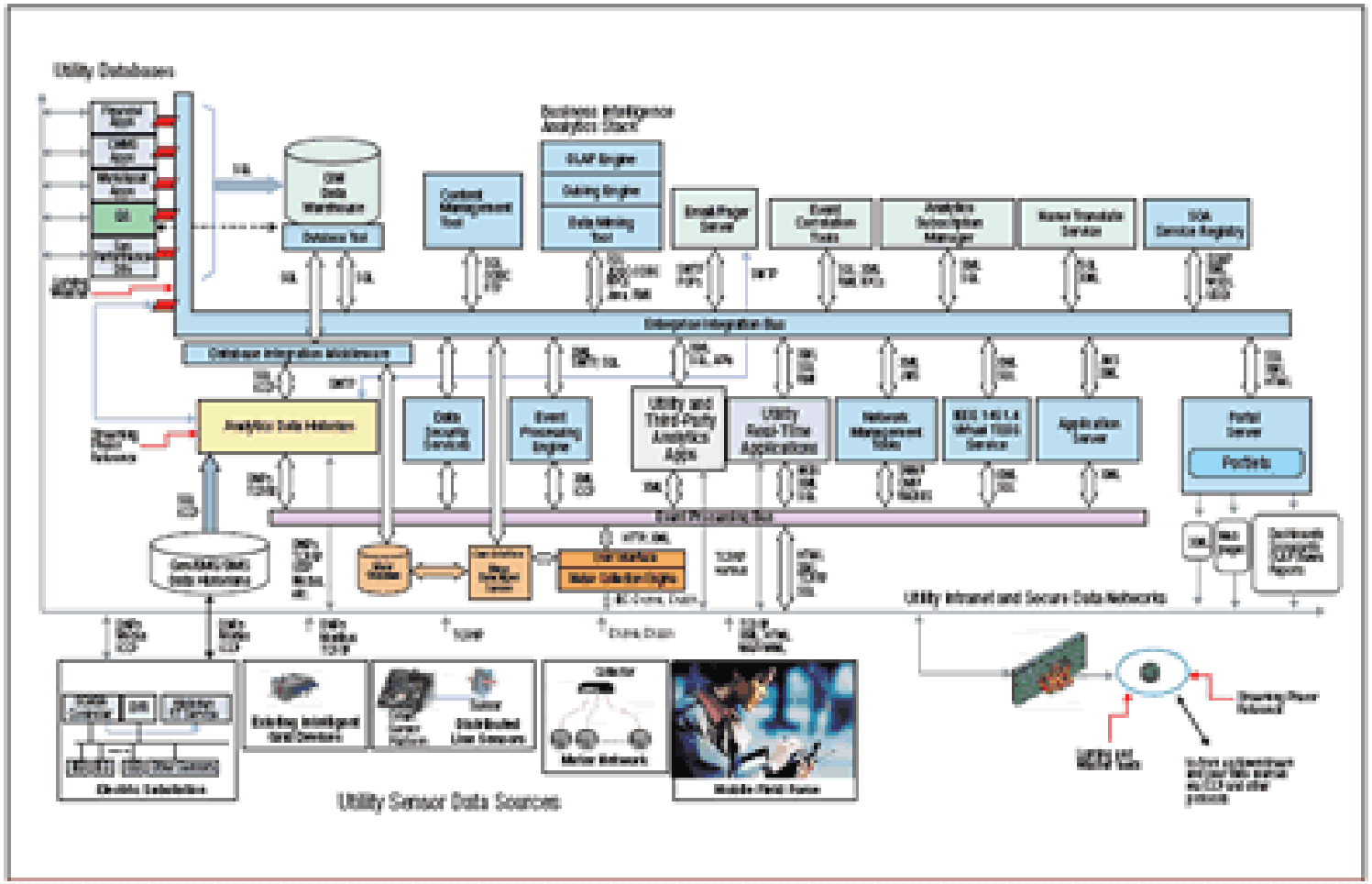
Utility's need different kinds of analytics

- Proactive analytics (near real-time operations)
  - Data historians (sensor data)
  - Meter databases
- Reactive analytics
  - Data warehouses

Some vendors are pre-integrating elements of the utility analytics platform

- "**September 27, 2011:** Leading smart grid solutions providers, XXXX and XXXX announce today that the companies are strengthening their already market-leading collaboration by moving to pre-integrate the XXXX solution portfolio with the XXXX Meter Data Management System (MDMS), using the next generation of the **International Electrotechnical Commission - Common Information Model (IEC-CIM) 61968-9 (2nd Edition)**. "

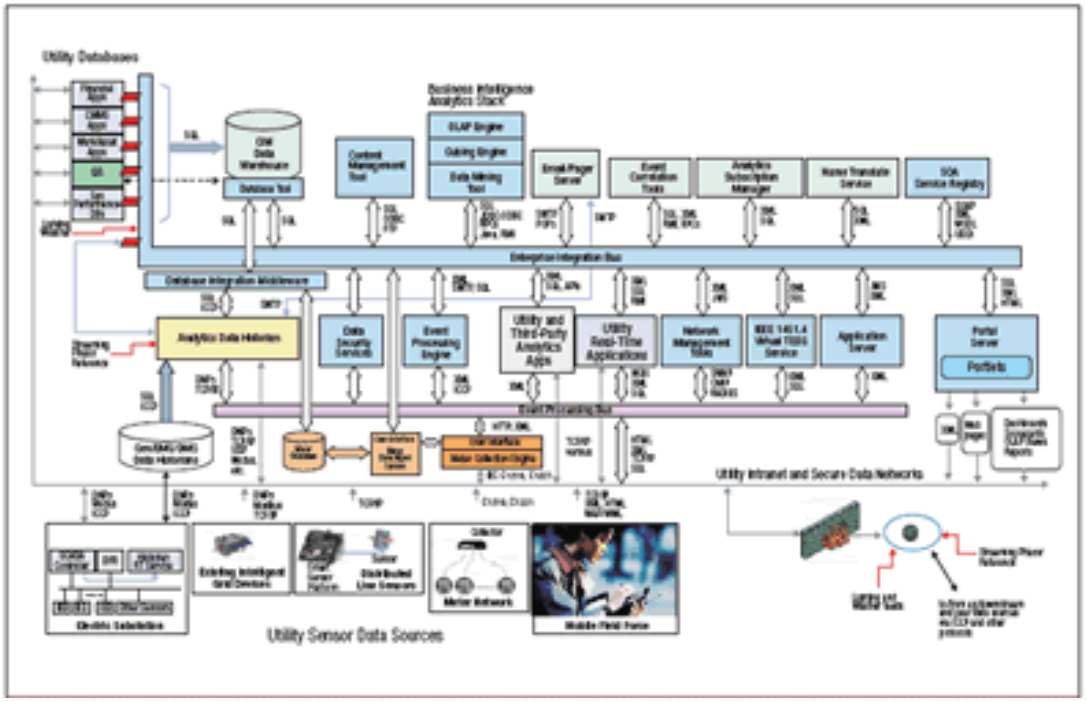
Typical Analytics Architectural Framework



Taft 2007

Architecture Fundamentals

- SOA
- Integration Bus for business events
- 2nd event processing bus for real-time event data integration
- CIM-structured warehouse



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Utility Data Analytics Implementation Obstacles and How CIM Helps

Typical Utility OT/IT Application As-Is

- Sensor-based and specific real-time operational data analytics (DA, DR, spatial) are fairly well-defined on their own
- Most back-office and business applications manage, report, and analyze their own separate data
  - Current state for many utilities
  - Sometimes there are one or two applications that try to tie it all together (GIS, MDM, CIS)
  - Issues with data redundancy and data integrity
  - Usually reflects silo'd business operations (E&O, back office)
- Some Applications share operational databases
  - Typical of ERP and/or pre-integrated applications
  - But they only know about what they know about

CIM – Definition

- A common information or common data model (CIM) is a common model that represents the semantic structure that is *common* to multiple data sources and data services. Class maps (a specification of correspondences between properties of one class and properties of another class) define correspondences between the common data model's domain schema and the schemas in data sources and data services.

Role of CIM and Analytics Platforms

- Building an analytics platform without understanding how it will be used to impact the business is a waste of time.
- In addition, you must understand how your data is behaving and interoperating in your application stacks to truly understand how to design your warehouse.
- Building an analytics platform without the proper set of controls to maintain and grow the value of your information assets is also a waste because the value of those assets begins to decline on day two after go-live.
- Enterprise Information Management process, such as data governance, program governance and process governance must be in place to protect these assets up front.

If you are using a CIM, then you know how your data is behaving, you know where you can impact your business, and you have the foundation of an EIM process

Role of a CIM in Analytics – In support of Implementing SOA

- **Service-Oriented Architecture (SOA) is a fundamental element of analytics architecture**
- As organizations attempt to figure out the data in the context of SOA, they are often driven to the notion of a common way to view data as a part of the architecture. This becomes a crucial aspect of designing an SOA because different services, and applications, need to share semantics so that they deliver accurate and reliable results.
- The single most important component of an SOA is the data, which means you need to think carefully about how the data is managed and ultimately resolved.
  - Face the data first and define a common information model so that the services are not bound to a particular schema.
- If you do not have a common information model, then you simply won't be able to effectively achieve the reusability benefits of an SOA. In order to achieve the benefits of an SOA, a common data model forces a foundation for data interoperability, and maintaining data integrity has historically been a huge issue across service providers.

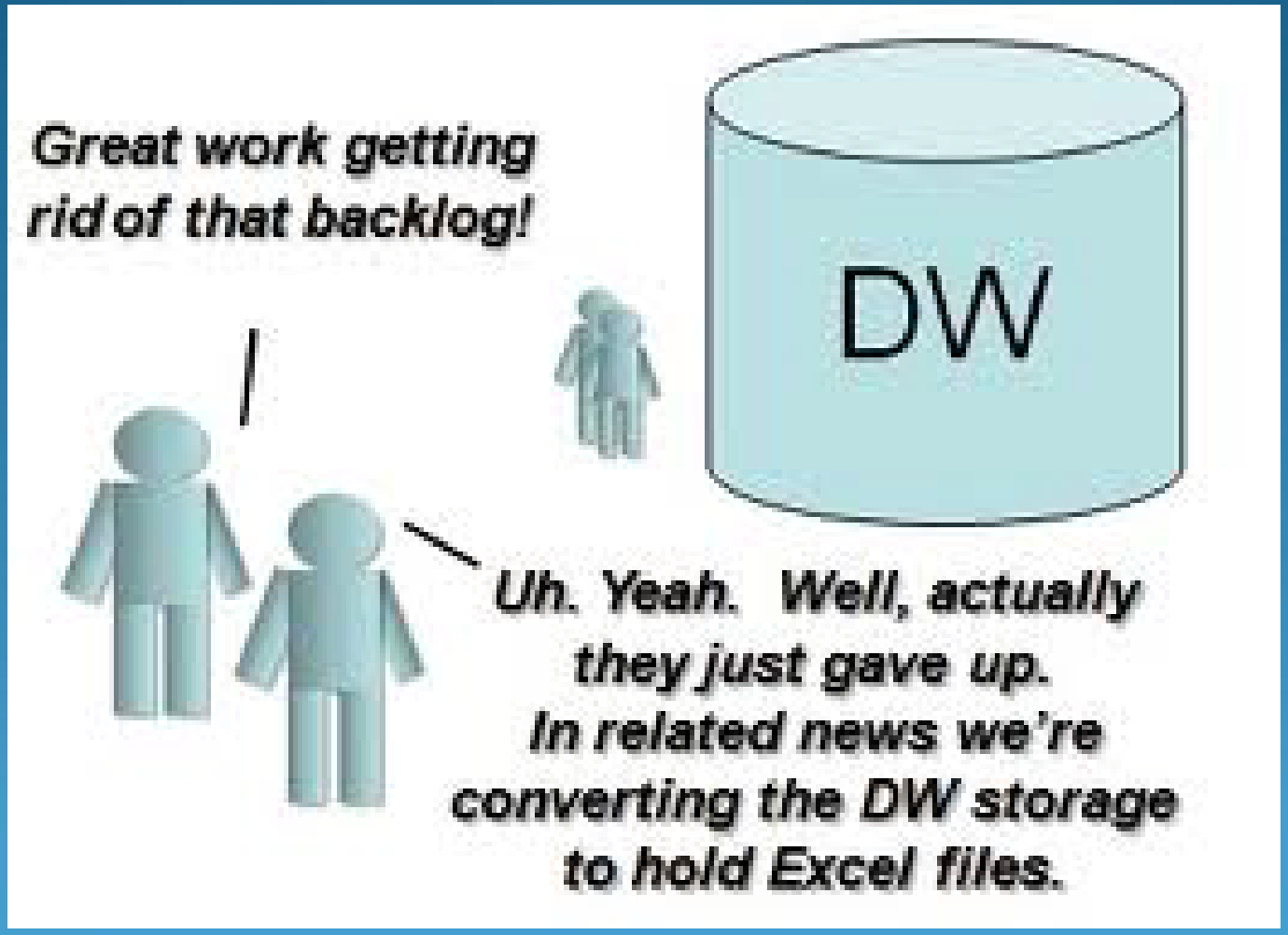
Role of a CIM in Analytics – In support of Implementing SOA

- **Primary issue with implementing SOA is** *minimizing dependencies when integrating applications that use different data formats*
- *This is why CIM's exist and this is why CIM is so important to building data analytic platforms!*
  - **Use a common information model to minimize application integration dependencies.** By designing a common information model that is independent from any specific application, you can require each application to produce and consume messages in this common format.
  - If all systems map to a common information model, then when one system changes, others don't need to, thereby providing a protection mechanism to ensure that the enterprise is not hamstrung by vendors who all maintain different information models.

Summary – Leveraging CIM to Enable Utility Analytics

- CIM and Enterprise Information Management
- CIM and Service Oriented Architecture (SOA)

Thank-You



"Torture the data, and it will tell you anything…"