Enterprise GIS Integration

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Agenda

• Data Integrations – 3 Key Objectives
• Two Mechanisms of Data Integration
• Determining how to best integrate your data to drive value
• Example: Maximo / GIS data integration
• Challenges
The discipline of data integration comprises the practices, architectural techniques, and tools for achieving the consistent access and delivery of data across the spectrum of data subject areas and data structure types in the enterprise to meet the data consumption requirements of all applications and business processes.¹

¹ From Gartner’s IT Glossary @ http://www.gartner.com/it-glossary/data-integration-tools
Integration Approaches – Point to Point

Point to Point: 1-way

- Easy to setup
- Quick to implement
- Can be done with a variety of technologies
- Increased maintenance costs as number of interfaces rise

Diagram showing interconnections between App 1, App 2, App 3, App 4, App 5, and App 6.
Integration Approaches – Enterprise Integration Hub (EIH)

EIH: 2-way

- Uses a service bus for guaranteed messaging
- A database to keep enterprise operational data, and
- An inquiry service to retrieve data in a standard format from the database
Determining how to best integrate the data

• 1 – way (Pass Through): Discover patterns and predict trends by spatializing customer data that already contains geographic coordinates

• 1 – way (Combine): Visualize relationships by managing a new dataset that can be directly associated with a customer/systems attribution

• 2 – way (Comingle): Create synergies between systems and gain operational efficiencies by playing to the strengths of multiple systems (rather than sacrificing functionality or attempting to create the one system to rule them all)
Integrations Driving Value

1-way / Pass Through

- One Call (tickets & urgency)
- Measurement (meters & volumes)
- Line Strikes (location & severity)

Delivery of data across the spectrum of data subject areas
Integrations Driving Value

2-way / Combine

- Land management/Areas of dedication (easements, customer leaseholds)
- Financial/Enterprise Entities (areas of responsibility)

Achieving the consistent access and delivery of data across the spectrum of data subject areas
Integrations Driving Value

2-way / Comingle

• Asset data management (GIS/Maximo example)
• Document Management (Asset based storage and retrieval)

Example:

• GIS is the system of record for pipelines and appurtenant equipment
• Maximo is the system of record for facilities and equipment
• How can users see the whole picture and leverage the data from both systems, while maintaining the integrity existing business processes?

Meet the data consumption requirements of all applications and business processes.
Example: GIS Sourced Equipment Flow

1. **GIS Analyst**
   a) Receives survey data to create Alignment Sheet
   b) Adds new Asset(s) to GIS
      - GIS assigns Asset GUID
      - Attaches new Asset(s) to Facility Site and/or Route

2. **GIS Publishing Equipment Adapter**
   a) Pulls new Assets from GIS
   b) Assigns Enterprise ID & Label for each new Asset
   c) Publishes new Asset with Enterprise ID & Label in EIH
      - Includes common attributes and GIS GUID
   d) Notifies/updates GIS with newly assigned Enterprise ID & Label for each new Asset

3. **Maximo Consuming Adapter**
   a) Pulls new Assets from EIH
   b) Sends out notification email to Maximo Change Management team with list of new Asset(s) with their common attributes entered in EIH

4. **Maximo Admin**
   a) Receives email with new Assets entered in the EIH
   b) References the same P&ID drawing used by GIS Admin
   c) Adds each new Asset to Maximo
      - Includes the Enterprise ID & Label
      - Maximo assigns the Maximo Asset Number
      - attaches new Asset to Facility Site / Process Area / Segment Location Record that matches the GIS assignment

5. **Maximo Publishing Adapter**
   a) Pulls new Assets from Maximo
   b) Updates the Asset in the EIH with the Maximo Asset Number (and any other common attributes updated by Maximo) referencing the Enterprise ID

**Diagram Descriptions**

- **PODS DB**
- **Maximo DB**
- **Survey Data**
- **P&ID Drawing**
- **GIS**
- **Maximo**
- **Enterprise Integration Hub**
- **Maximo Consuming Adapter**
- **Maximo Publishing Adapter**
- **GIS Publishing Equipment Adapter**
- **Maximo Admin**
- **Survey Data**
- **Maximo**
- **Enterprise ID Service**
- **GIS**
Example: Maximo Sourced Equipment Flow

Maximo Publishing Adapter
- Pulls new Assets from Maximo
- Assigns Enterprise ID & Label for each Asset
- Publishes new Asset with Enterprise ID & Label in EIH
  - Includes common attributes and Maximo Asset Number
- Notifies/updates Maximo with same Enterprise ID & Label for each new Asset

Maximo Equipment Publishing Adapter
- Pulls new Assets from Maximo
- Assigns Enterprise ID & Label for each Asset
- Publishes new Asset in EIH
  - Includes common attributes and Maximo Asset Number
- Notifies Maximo with same Enterprise ID & Label for each new Asset

GIS Consuming Adapter
- Pulls new Assets from EIH
- Updates GIS staging tables with the list of new Asset(s) entered in EIH

GIS Equipment Publishing Adapter
- Pulls new Assets from GIS
- Updates the Asset in the EIH with the GIS GUID (and any other common attributes updated by GIS) referencing the Enterprise ID

Maximo Admin
- Receives new P&ID Drawing
- Adds new Asset to Maximo
  - Includes the Asset Tag from the P&ID Drawing (if available)
  - Maximo assigns the Maximo Asset Number
  - Attaches new Asset to Facility Site Location Record

GIS Analyst
- Reviews new Asset(s) in GIS Staging tables
- Reference same P&ID drawing use by Maximo Admin
- Adds new Asset to GIS
  - Includes the Enterprise ID & Label
  - GIS assigns Asset GUID
  - Attaches new Asset to Facility Site in GIS that matches the assignment in Maximo

Example: Maximo Sourced Equipment Flow

- Maximo DB
- GIS
- PODS DB
Integration Challenges

• Point to Point
  • Inconsistent data standards
  • Management can become unwieldy (upgrades, schema changes)
  • No master data management (mixed data values)

• Enterprise Integration Hub
  • Dependence on the Hub
  • Specialized skillsets to build adapters and maintain infrastructure
  • Requires governance to maintain standards