Considerations for SAP / GIS Integration

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Impress Software
Agenda

- Introduction
- General Considerations
  - Asset Identification
  - Data Redundancy
- Specific Considerations
  - Versioning in ESRI
  - Split process
  - Work localization
Impress for GIS

Packaged integration application optimized for bridging SAP with ESRI.
The Impress Difference

Considerations:
- Time to value
- Complexity
- Available expertise
- Ability/cost to change

Benefits:
- Rapid time-to-value
- Reduced Risk
  - Full support
  - SAP certified
  - Upgrade-able
  - Configuration Control
- Prepackaged Experience
Asset Identification
Initial Situation

Transformers
Circuit breakers
Service Lines
Poles

Service Points
Customers
Consumption
Some Network
Asset Identification
Initial Situation

Typical starting point:
• Some assets are only in GIS
  – If needed in SAP, the interface can generate these automatically
• Some assets are only in SAP
  – If needed on the map, a carefully planned semi-automated process can place them
• Some assets are in both systems
  – Major challenge is the cross system identification
Asset Identification
Link Existing Data

- Initial match algorithm necessary
  - Can be complex and involve multiple fields
  - Can be identical to asset identification
  - Typical examples can involve
    - Tag numbers
    - Serial numbers
    - Address

- There is always a match algorithm!
- Initial match should result in a properly maintained cross system identification
Asset Identification

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Asset Identification
Matching vs. Cross System Identification

• Matching
  – Can be a slow and complicated process
  – Might not cover 100%
  – Is run only at the beginning and in subsequent consistency management

• Cross System Identification
  – Used in all integrated processes
  – Has to be fast and easy
Asset Identification
Cross System Identification

• Typical cross system identification schemes
  – A key table is maintained
  – The SAP ID is written to GIS (or vice-versa)
  – A cross system asset ID is issued
Asset Identification
Key Table Maintenance

• Interface Key Table
  – Relies on the interface processes
  – Rogue processes will create non-identifiable assets
  – If key table is corrupted, no link recreation possible (unless a proper matching algorithm is available)
  – Clean data models
  – A match algorithm can help
Asset Identification
System ID Cross Reference

• SAP ID in GIS (or vice-versa)
  – Does not need any additional information to recreate links
  – Relies on the interface processes
  – Rogue processes will create non-identifiable assets
Asset Identification
Cross System ID

- **Real unique cross system ID**
  - Does not need any additional information to recreate links
  - Completely able to automatically correct rogue processes
  - Usually change issues

- **SAP specific concerns:**
  - Do not use slow / indirect fields like classification
  ...
Asset Identification

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Asset Identification
Flow During Asset Creation

• Where do assets enter the system?
  – Added to GIS -> Created in SAP
    • Typical for engineering assets
  – Added to SAP -> Created in GIS
    • Typical for service points
  – Added to GIS from the as-build but already in SAP
    • Basically a variation of the first point
Asset Identification
Started in GIS

• As soon as assets are added to GIS, SAP assets are created
  – Typically, this can be done rather automatic
  – Required fields and structures (i.e. superior functional location) can be detected
Asset Identification
Started in SAP

- As soon as assets are added to SAP, GIS assets should be created
  - Automatic solution dangerous because SAP does not validate geo reference
  - Semi-Automatic process can help by pre-locating assets via
    - Superior Functional Location
    - GPS Coordinates
    - Feeder
    - Addresses
Asset Identification
Started in GIS but already in SAP

• When the as-build enters GIS, assets are created in SAP if they are not already there
  
  – Requires a good matching / cross identification algorithm
Asset Identification
Consistency management

• Processes that analyze changes and edits in both systems for their consistency

• Avoid a growing discrepancy …
Data Redundancy

Transformers
Circuit breakers
Service Lines
Poles

Service Points
Customers
Consumption
Some Network
Data Redundancy

- Data Redundancy is bad!
- Can it be avoided?
- When does it hurt?
Data Redundancy
When is redundancy necessary?

- **Performance**
  - Rendering SAP Information on the map
  - Using consumption data for geo analysis

- **No real-time hooks**
  - The asset itself
  - SAP ERP reporting

- **Disconnected (Mobile) use**
Data Redundancy
When does data redundancy hurt?

- Data redundancy is not as harmful as process redundancy
- A properly enforced “mirror”-redundancy is manageable
Data Redundancy Principles

• If information is really needed in both systems, (non-redundant) real-time access should be considered whenever possible.

• The decision about redundancy should be done on field/attribute level.

• For each given piece of information (attribute), a master system should be identified.
Data Redundancy
Real-time access
Data Redundancy
The Master

• Which system should be the master for a given piece of information?
  – Basically the system where the information is maintained
  – This can be different from the system where the data is created
    • Example: Switch State
  – If a given piece of information is maintained in both system, you should consider your processes
### Data Redundancy

#### Field Level Control

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Data Redundancy
Do not overload SAP

• SAP has two main angles on spatial assets:
  – Maintenance planning & execution
  – Controlling and financial reporting

• The granularity of SAP should be aligned with the needs

• Be bold! – a good integration can relieve SAP from tasks it is not optimized for
Versioning in ESRI

Basics

- SAP is not versioned

- Due to the focus on maintenance and operational controlling, SAP usually represents as-maintained / as-built
  - At least for the PM asset inventory

- -> SAP should equal As-Build (Default)
Versioning in ESRI
Changes in GIS

• Whenever GIS updates default, SAP should be updated

• Pro: not matter how the data changed in GIS (e.g. mobile check-in), it will hit SAP
Versioning in ESRI
GIS Changes in Impress

1. GDB Impress Temp Version
2. Get Difference
3. Process Updates
   - Problems
   - Yes
4. Log Updates with Errors
5. Delete Reference / Rename Temp To Reference

- GDB DEFAULT Version
- GDB Impress Temp Version
- GDB Impress Reference Version
- Deltas
- SAP
- SAP Error Logs

- Stored in GIS GDB
- Stored in Impress
- Stored in SAP
- ? See notes
- × Deleted after phase
Versioning in ESRI
Changes in SAP

- SAP mastered data is non-versioned
- If written to a version, it is not visible across all versions and not immediately visible. It could result in posting conflicts
- Possible solutions are joins with non-versioned tables or simple feature classes
Versioning in ESRI
SAP Data Cache

• If an asset is created, data might be entered that is meant to be in SAP

• However, this asset does not hit SAP until it is posted

• A version related data cache is necessary
Split Process
Problem

• In GIS, a piece of pipe is split and has new segments

• SAP does not know split process. Thus, newly created segments will lose history

• There is no standard in SAP
Split Process
The Impress Suggestion

• The pipe that is split is set inactive

• New segments are created

• The SAP Object Link is used to link the new segment to the inactive segment

• In Impress’ “Order History” process, this link is resolved
Georeferencing Orders

Problem

- No matter how detailed an object structure is in SAP, the location of a given work order is not known
  - Largely on linear assets

- Work orders get an additional geo-reference (Lat/Long or Stationing Value) and can be displayed on the map as point features.
Questions

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