Spatially-Enabled Business Processes in SAP with GIS Integration

CRITIGEN'S POINT OF VIEW

Historically GIS technology has been utilized as a departmental infrastructure mapping tool in asset intensive industries such as utilities and transportation organizations, and not integrated into business systems such as enterprise asset management systems (EAM). Over the last two years SAP has made significant investment in geo-enabling its core business suite (ECC), database (HANA) and mobile platform (SMP and Work Manager). These new capabilities have opened the door to have spatial functionality natively tied to data objects – master and transaction – inside the SAP landscape, as well as to integrate business process relevant data from GIS and other spatial repositories into the business process environment managed by SAP. The result is that business systems and geographic information systems are now effectively working in concert with each system retaining its primary function.

The business value is more efficient processes and better decision-making through the understanding of location and spatial relationships. Furthermore, the seamless availability of integrated information from multiple enterprise systems, including GIS, to employees working in the office or in the field decreases the operational risk and increases compliance.

UNDERSTAND BUSINESS NEEDS & EXPECTED BUSINESS PROCESSES

An effective GIS integration strategy is responsive to the overall enterprise business needs and drives tangible business process improvements. To that end, Critigen first seeks to understand the specific business processes that would benefit from improved access to spatial information, as well as the data visualization most appropriate for the user role. On that basis a focused execution agenda can be derived for the following categories:

- Data Management & Quality
- Data Synchronization
- Data Visualization
- Mobility
- Change Management
Most asset intensive organizations have very robust GIS mapping tools to visualize their physical assets that are maintained in the GIS. In addition, many organizations are using an asset management and/or work management system to manage their assets and maintenance work. Very few organizations are fully integrating data from both their GIS and business systems, e.g. EAM.

The level of integration varies depending on business process, but the following are typical integration requirements in EAM for example purposes:

- EAM user needs to view GIS data within EAM
- EAM user needs to edit/create GIS features (transactional or assets) within EAM
- GIS user needs to view EAM data through a GIS desktop or web applications
- GIS user needs to edit/create EAM data within desktop GIS software
- GIS and EAM data needs to be available on mobile devices

**SYSTEM OF RECORD (SOR) DETERMINATION**

Effective SAP/GIS integration requires a mix of technology and processes all driven by the organization’s business needs. After business needs are understood, the next step in the integration strategy is determining the system of record (SOR) for shared data. There are many topics that need to be considered when determining the system of record:

a) **Data collection and maintenance processes:** Understanding the data flow between GIS and business systems, e.g. EAM, is critical to both SOR determination and the data synchronization strategy. For example, some organizations create the proposed asset in EAM first but wait until it reaches the as-built phase to create assets in GIS. Determining the systems in which the asset is first created and what system is used to maintain the asset over time are two key elements for selecting the appropriate system of record.

b) **Data Stewardship/ownership:** Another consideration when determining SOR is understanding who is ultimately responsible for the quality of the data. This group will have a vested interest in keeping the data maintained over time. The group owning the data are often experienced in either GIS or EAM, which should be considered in the SOR determination due to training implications.
c) **Data Usage/Purpose:** GIS data and the associated attributes are utilized by multiple groups within an organization and understanding how these data are used across the organization can influence the SOR determination and help avoid unintended impacts. When looking at GIS data through the lens of EAM, a particular stakeholder may only care about a subset of GIS attributes, but another group or even a specialized EAM user-role may depend on an entirely different set of attributes for their business process. Selecting the appropriate SOR for asset attribution, will make it easier to leverage out of the box capabilities for analysis and reporting that require data to be stored in the native data model.

d) **Data Models and Technical Suitability:** Business systems and GIS have their inherent strengths that should be leveraged when determining the appropriate SOR. For example, GIS core capabilities make it the leading contender to store information about physical assets. Business systems are most appropriately for managing business data such as asset financial information, work orders, and work history. There are a variety of industry published GIS data models that can be utilized within a utility or transportation organization and the usage of geometric networks vs. linear referencing system (i.e. dynseg, stationing, mileposts, etc...) will influence the SOR determination and synchronization strategy.

e) **Decision and Cost Estimating Process:** Many organizations utilize CAD/graphical design tools when designing new projects. How the construction drawings/designs and cost estimating is performed could impact the SOR. SAP can utilize compatible units (CU) but there are also GIS benefits and associated tools/software with cost estimating functionality. The appropriate SOR for CUs and for performing cost estimation needs to be determined. The degree to which CUs and cost information is shared between systems will impact the synchronization strategy.

After evaluating each of the criteria listed above it will become clear that some asset types are better suited to an EAM SOR and others toward GIS, while some data and the associated attributes may not be so clear and require the organization to compromise which stakeholder is ultimately responsible. The graphic below is an example of two different asset types and the potential SOR.
DATA SYNCHRONIZATION AND INTERFACE STRATEGY

The Business Systems/GIS data synchronization strategy can be established once the System of Record is determined, visualization tool requirements are documented, and the data management processes have been defined. The strategy should be based on the business processes that are defined during the Design/Blueprint phase of the project.

Some of the key considerations for data synchronization include:

- Only synchronize data (and attributes) that are required by business processes. Background or supplemental data should be made available through service oriented web map services if possible.
- Develop rules for one direction and/or bi-directional synchronization. Depending on your business needs this could be at the layer level or at the attribute level.
- Transactional (work orders and notification) data should be available as close to real-time as possible.
- Mobile strategy (connected/disconnected) will impact your synchronization strategy if the solution requires data from both GIS and Business Systems.
- Non-functional requirements should be considered, such as application maintenance/support, frequency of GIS software upgrades, scalability, connectivity issues, SLAs, etc...

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