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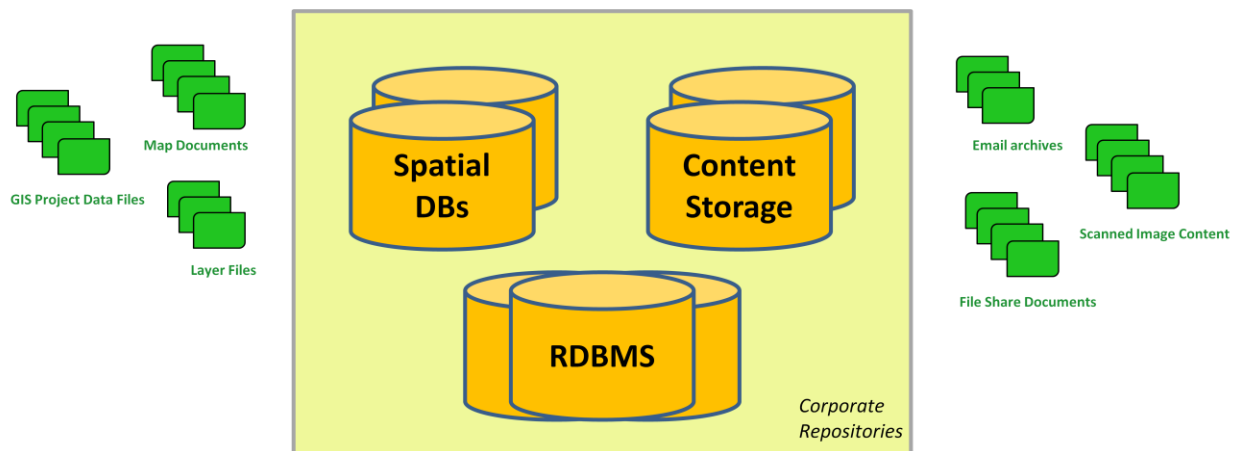


Managing GIS Assets and Spatial-to-Content Relationships

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The Environment

Over the past decade or more, energy companies have successfully established master databases or corporate repositories for both spatial data management and enterprise content management. With advances in technology and work processes, these systems have evolved from departmental solutions to enterprise-wide applications integrated into various corporate workflows. At the same time, the use of GIS applications and content-generating systems (e.g. email, websites, collaboration tools, etc.) has continued to grow dramatically. As illustrated in the diagram below, the result is an environment consisting of GIS assets and general content (related and unrelated) that exists and multiplies outside standard corporate repositories, workflows, and governance.



Process-Oriented Corporate Data Management

For corporate or master databases, well-worn processes have been established with corresponding workflows. Unlike “non-process-oriented” data management types, this information follows a prescribed process and typically ends up in a corporate repository or master database. For example, well log information is processed and entered into a corporate data store. Logs are a typical type of unstructured content, managed in proprietary, vendor-specific system, or traditional ECM solutions. In a similar way, well location data is updated for the enterprise on a regular basis, and generally follows a process to update the corporate spatial database.

Non-Process-Oriented Data Management

Corporate data management is a much greater challenge as we consider data not processed via “master updates” and structured workflows. This includes data and files distributed across local “C” drives, file servers, mail folders (PSTs), and other locations. It includes information and data generated internally through the course of business, as well as information acquired by project teams and departments outside the “master updates” process. It also includes “GIS assets” such as map documents, layer files, project-level shapefiles, etc. and a plethora of

related unstructured content such as files and images containing field data, external studies, interpretations, PPTs, etc.

Non-process-oriented content presents greater challenges due to several factors:

- More voluminous
- Random and inconsistent (file) location – according to the user’s discernment
- Non-standard categorization / lack of metadata
- Search and retrieval are difficult, with unreliable results
- Access rights and control
- Multiple versions
- Retention policies, etc.

The Problem

Given the size and complexity of the environment, most energy companies would have difficulty locating even basic information and data – for example, the internal, definitive set of data/files/documents for a prospect evaluation from 2 years ago, OR all G&G data for a given well currently in the E&P lifecycle. There are two aspects to the problem:

1. First, a more structured approach and process is needed to manage non-process-oriented data. Given the fact that users will (and should) continue to create data internally (e.g. map documents, layer files, associated spreadsheets and PPTs), tools and processes are needed to manage this internally-generated content. Additionally, external information and data (e.g. email, field data, project-specific vendor data, etc) that does not follow a “master update” process will likely continue to grow as a percentage of enterprise data.
2. Second, connections between various content types, especially spatial to related documents/content, must be created, preserved, and managed. Many organizations have “silos” of content that exist independent of each other, resulting in an incomplete picture of a prospect, a project, or an incident. The risk associated with incomplete information, especially as it relates to HSE or e-discovery/litigation issues, is enormous.

The challenges of managing content outside corporate repositories, and linking spatial data to related content, are not new in the energy industry. However, these problems have received a new level of attention, primarily due to the magnitude of the problem, and the costs to the organization.

The Solution

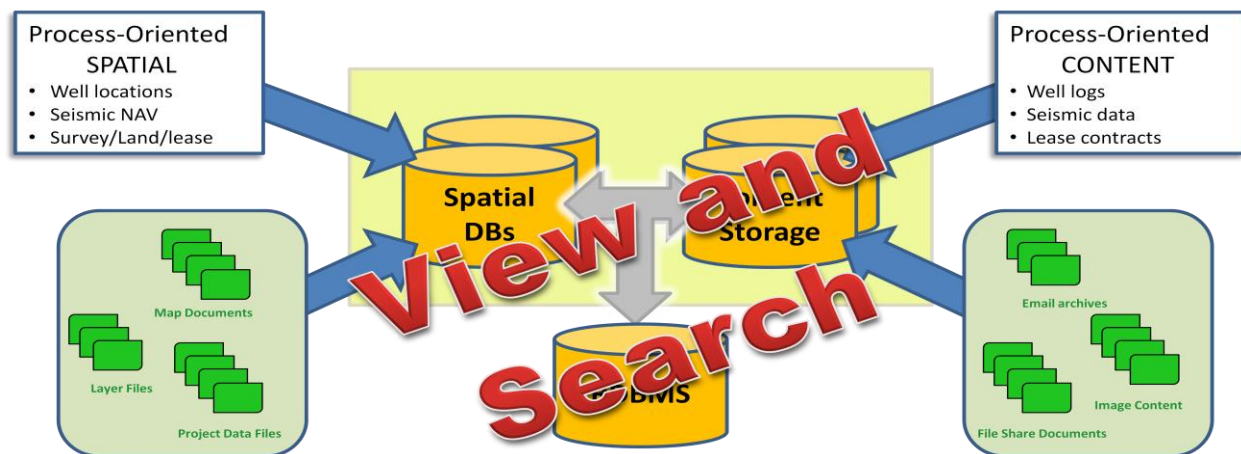
Any solution must adhere to accepted technology best practices, and in today’s environment, should involve service-oriented architectures and frameworks for content-enabled vertical applications (CEVAs). In this scenario, a CEVA built on ESRI and SharePoint offers a framework for addressing both major problems described above – the non-process-oriented content proliferation, and lack of content-links.

For spatial data management, ESRI technology is the de facto standard for managing corporate spatial data. Solution components to address the spatial issues include:

- Crawlers to identify and inventory GIS assets and/or geo-tag content (via Metacarta or other tools)
- “Decoders” enabling automated metadata creation and spatial feature (project boundaries) updates for GIS assets
- Reporting tools used to identify broken links, non-enterprise/potential spatial content, etc.

With enterprise spatial databases and GIS asset management processes in place, the rest of the solution focuses on connecting spatial data with related content. To address these needs, the solution requires additional tools such as:

- Integrated view and search functions – combining results for spatial and content/document repositories
- An architecture that enables federated searches across traditional content management systems, proprietary databases/systems, and commercial industry systems
- Standard metadata templates and/or custom taxonomy
- Features for uploading and bi-directionally linking content to locations
- Reporting tools to show content relationships, etc.

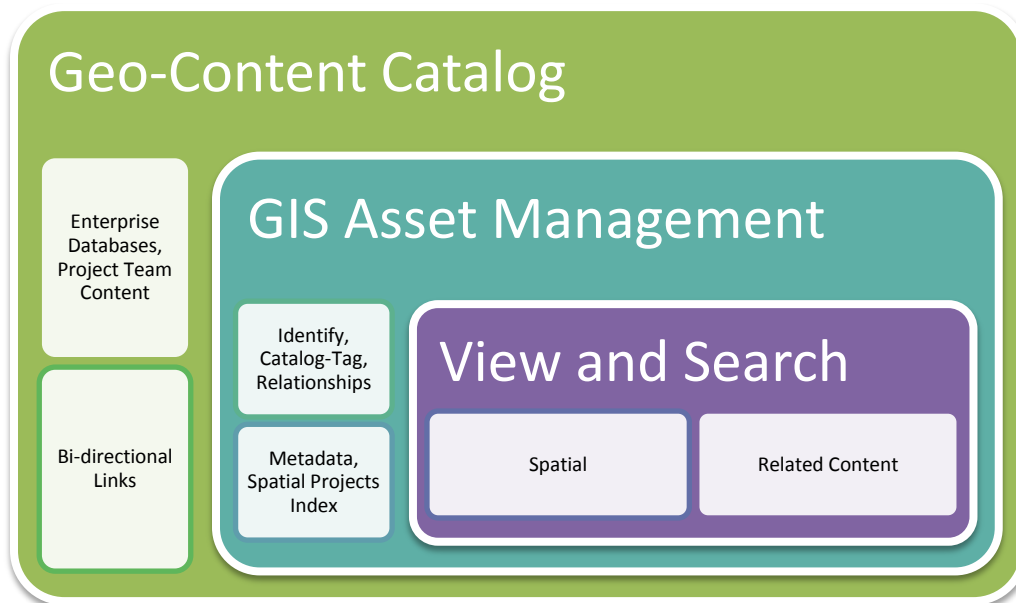


Gimmel Solution Framework

Gimmel’s solution framework builds on deep expertise in enterprise content and document management technology, and years of experience delivering GIS and spatial solutions. The GIS-ECM framework provides an architecture and solution model for managing GIS assets and enterprise content related to spatial data. It supports the development and deployment of enterprise-specific connectors while leveraging industry-standard products and tools.

Gimmel's solution provides a framework to:

- Establish standards for consistent application of technologies across the enterprise
- Define a clear and consistent set of business requirements
- Establish processes, models, and guidelines for ensuring regular adoption
- Tools to support standards, processes, and models
- Integrate location-based, spatial data with any related content



The benefits of this integration of spatial information with related content are:

- Increased productivity - with less time “hunting” for all the data and information
- Minimizing redundancy of information - by consolidating and managing the “floating copies” of data
- Reducing costs – by reusing previous project work, interpretations, etc.

About the Author

Lisa Derenthal is a Director of GIS Program Services at Gimmel Group. She has over 25 years of IT and business experience, developing and implementing enterprise GIS solutions across energy, land development/real estate, and government sectors. She holds a MBA from Rice University and a B.S. in Computer Science. Lisa is on the Board of Directors of PUG, a GIS industry committee for the oil and gas sector.