Sharing Geospatial Data and Applications in Petroleum E&P

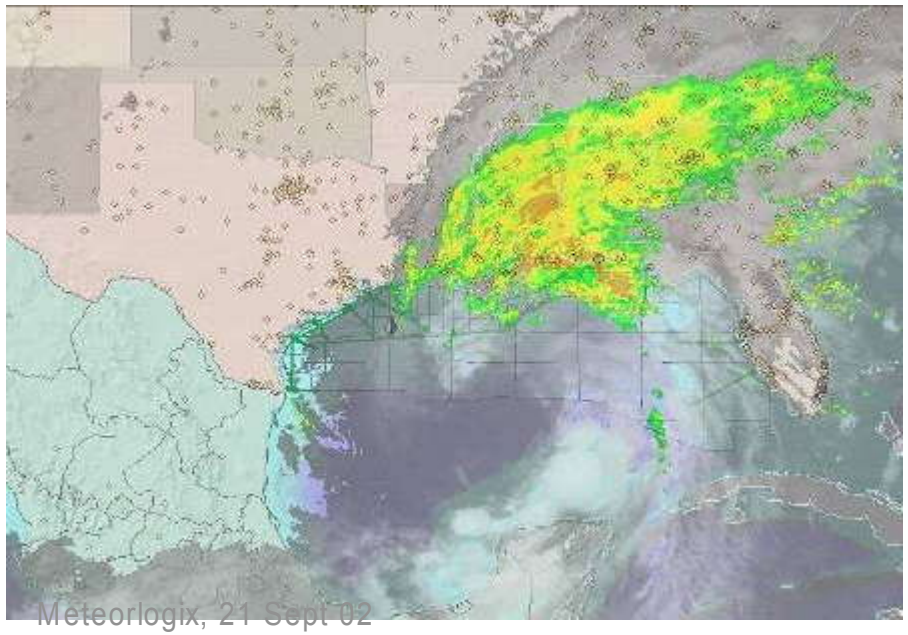
Andrew Zolnai

EAGE, Vienna

June 2006

The Perfect Storms

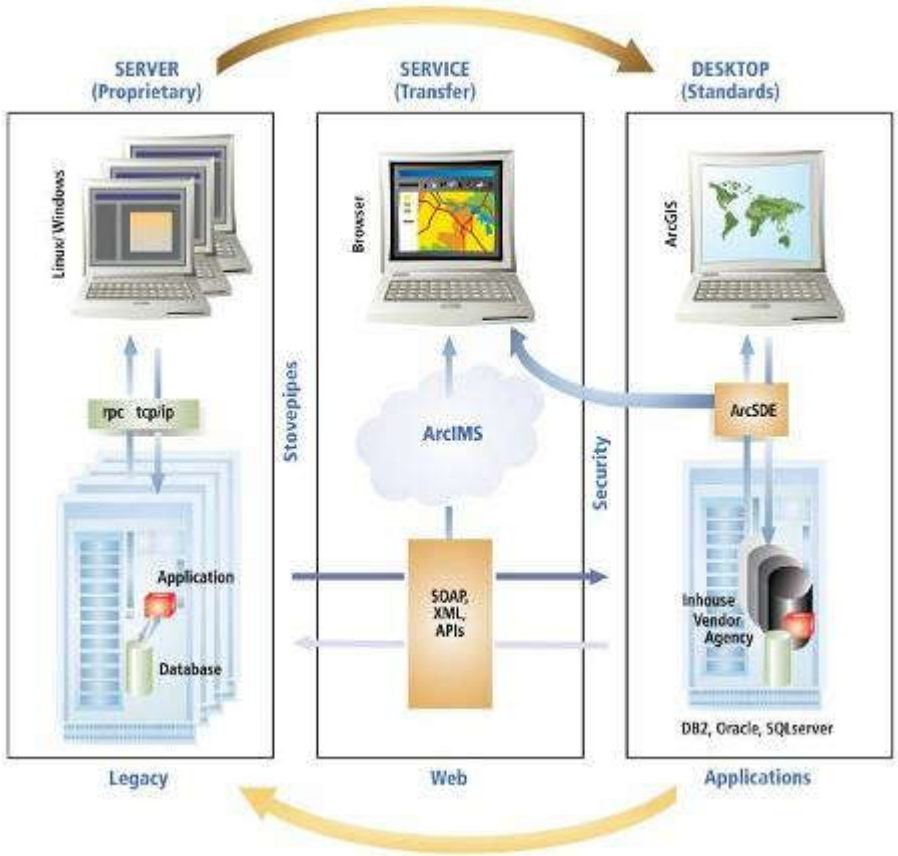
- Past Hurricane seasons in the US Gulf of Mexico created a flurry of activities well documented in the news
- Behind the news however, the greatest demand from users was satellite imagery in order to assess damages to field assets
- A relatively simple requirement that not just oil companies had difficulty fulfilling, but also regulatory and administrative agencies



Meteorlogix, 21 Sept 02

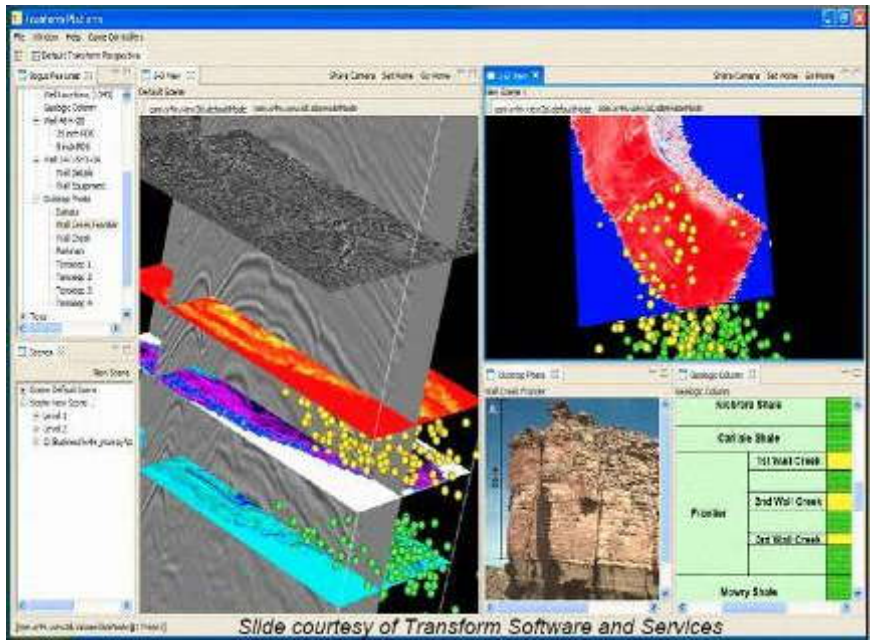
Purpose Today

- **Show why the current use of geospatial data in oil companies is not optimised**
- **Suggest how this may be remedied**



Current Workflow

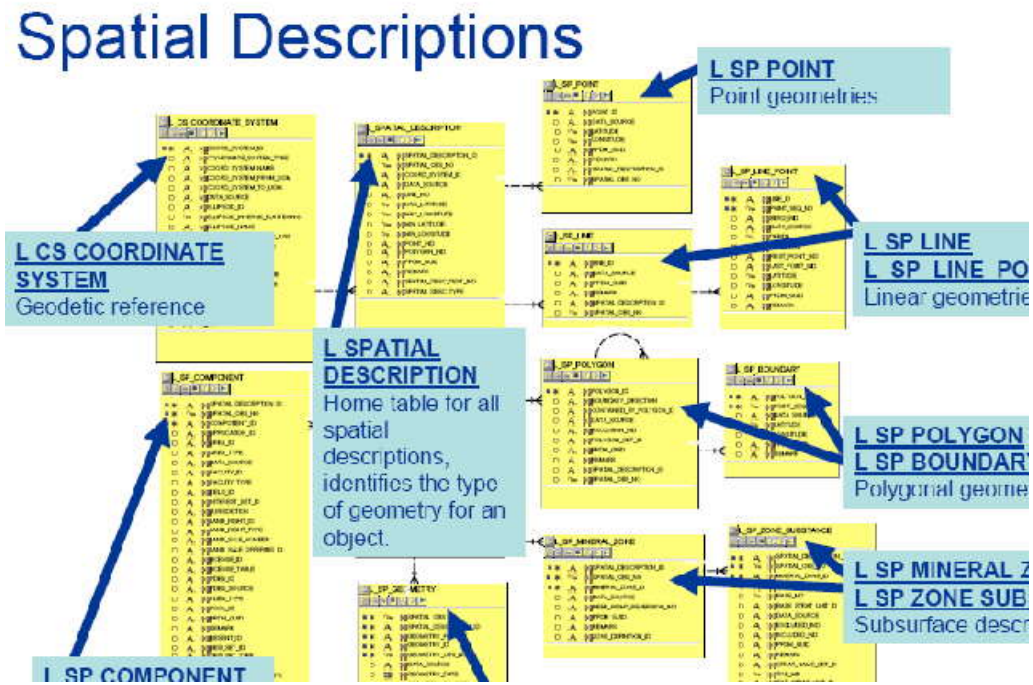
- Desktop
  - standalone spatial applications
  - project-based geoscience applications
  - disconnect between the two
- Server
  - legacy petrodata repositories
  - spatial enablement is limited
  - lots of import/export access



Current Workflow

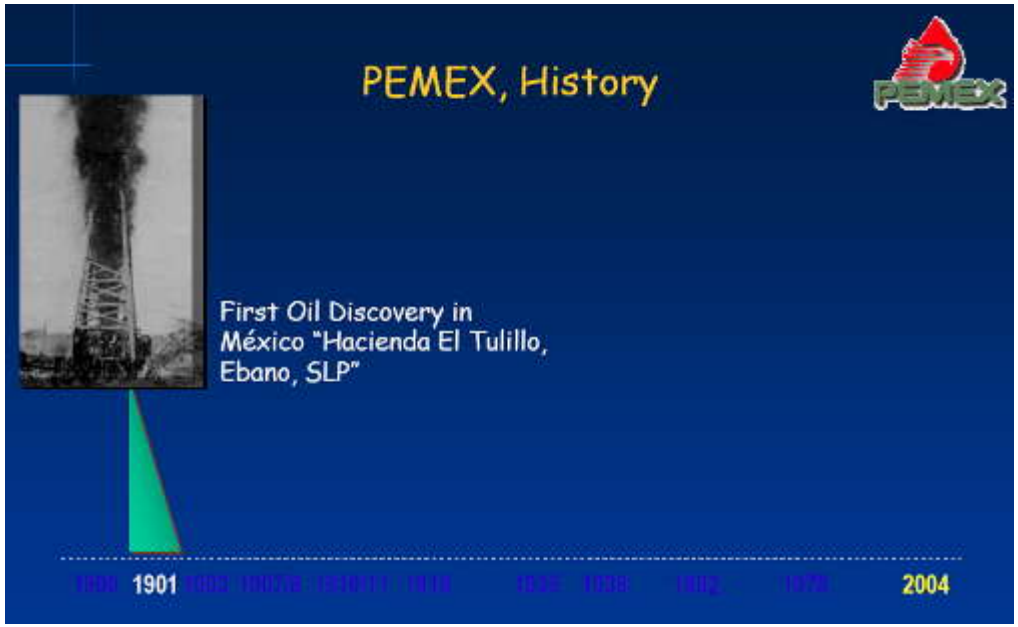
- **Service**
  - **web access to data warehouses**
  - **limited access to projects' spatial data**
  - **mainly access to corporate tabular data**

- ***Business rules?***
  - ***workflows broken after the desktop***
  - ***hard for user to go back and forth***
  - ***business process driven by technology***



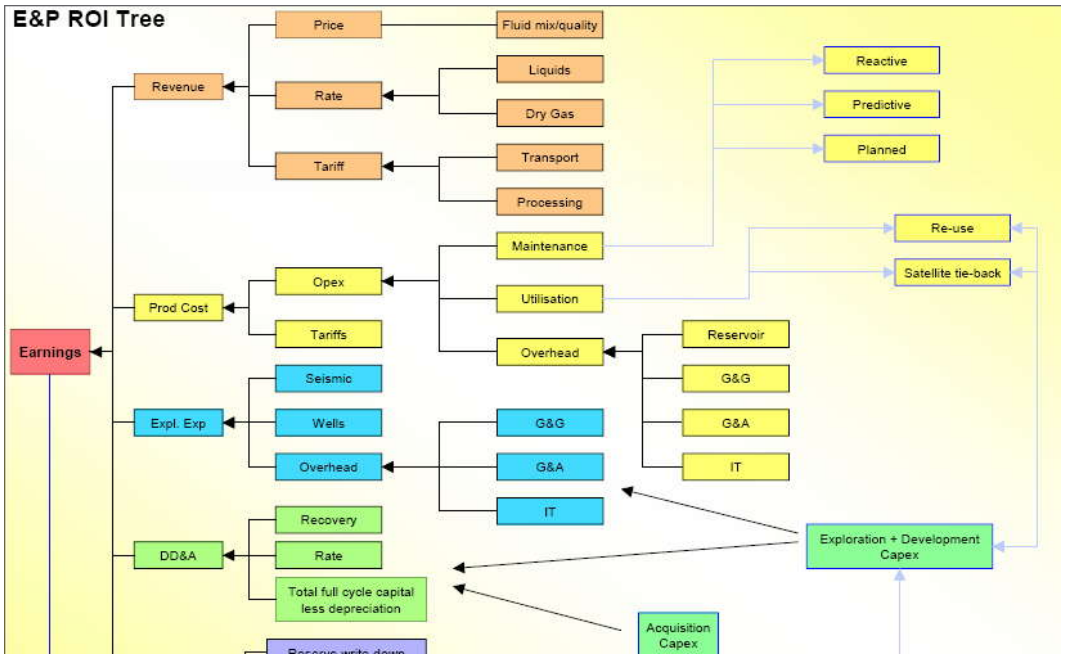
Obstacles to Integration

- Long time period
  - operated over fifty plus years
  - globally scattered operations
  - locally intensive applications
- Computationally intensive
  - very large datasets
  - regional seismic and satellite data
  - unevenly distributed well and log data



Obstacles to Integration

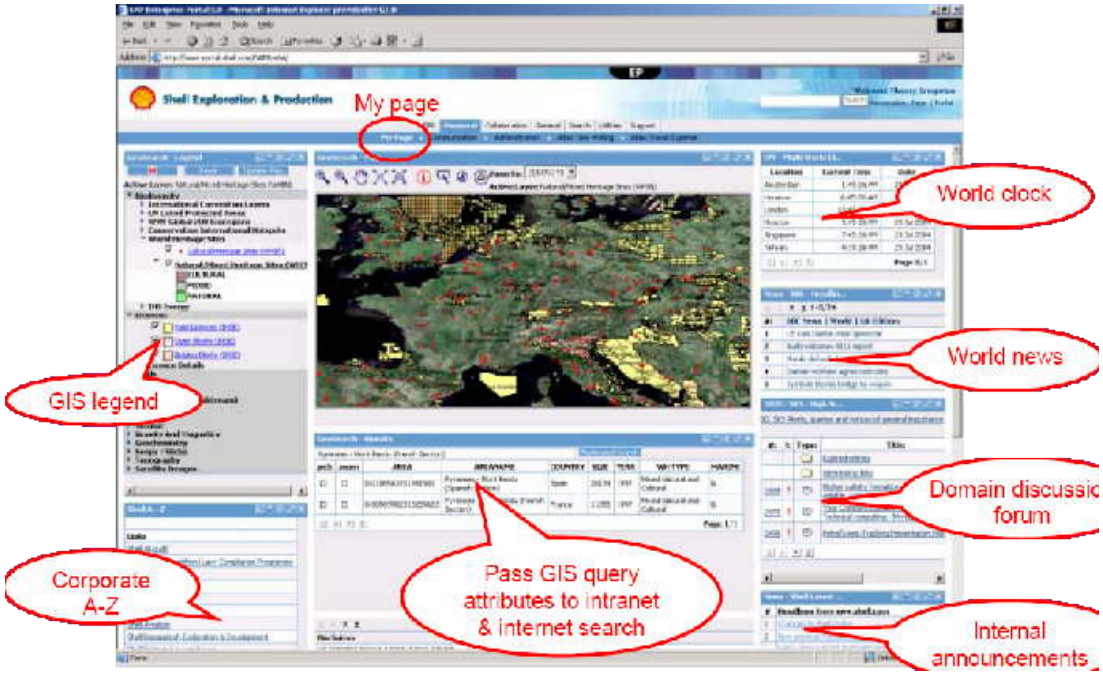
- **Data exchange protocols**
  - historically limited to file transfer
  - separation of drafting and engineering
  - separated from document management
- **Operational silos**
  - geology, geophysics, engineering
  - field versus office operations distinct
  - new &/or separate HSE hinders emergency response



Success Stories

- **Shell International**
  - **SAP portal including GIS access**
  - **Integrate datasets and applications**
  - **Eliminate redundancies and obstacles**

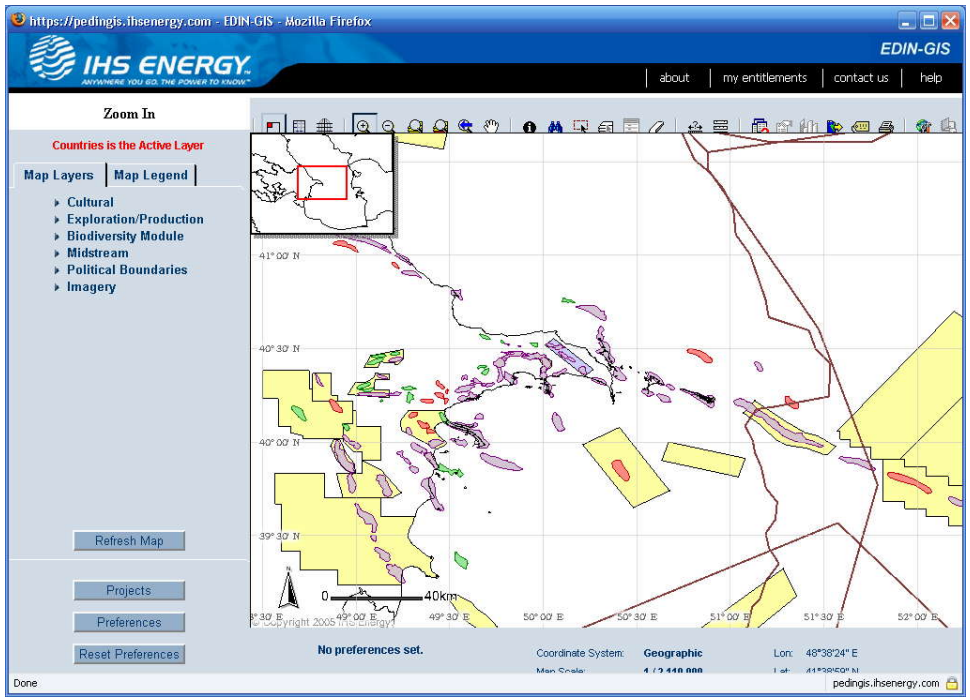
Spatial Portals: Gateways to Geographic Information (ESRI Press) – Chapter 10: Shell's Global Portals, Connecting a Global Enterprise



Success Stories

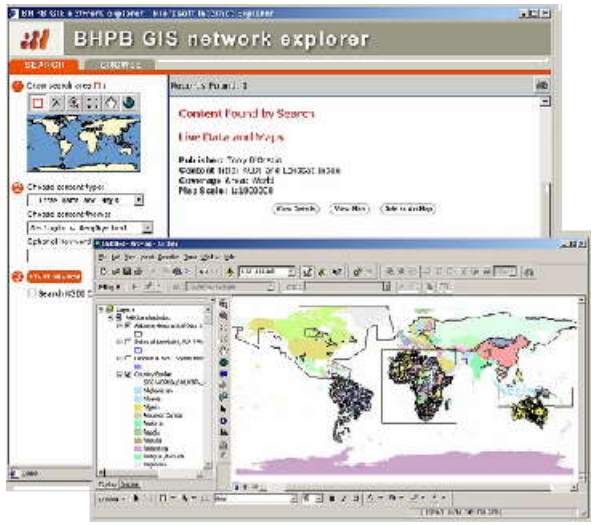
- **IHS Energy**
  - optimise data delivery to end-users
  - flexible access-points for end-users
  - Separate data management & delivery

Connecting our World: GIS Web Services (ESRI Press) – Chapter 11: Fueling the Oil and Gas Industry with Data



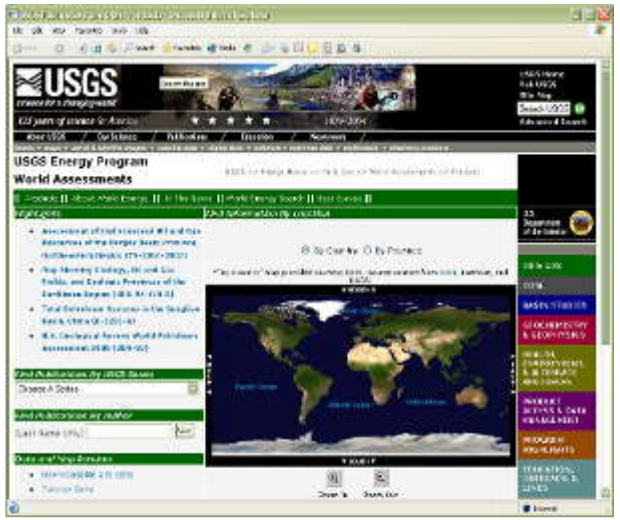
Suggested Improvements

- **Data management**
  - **Server repository**
    - speed for large datasets or satellite imagery
    - ease of management for regional offices
    - replication among scattered operations
  - **Server applications**
    - geoprocessing for access at the server level
    - server for stock satellite imagery on-the-fly
    - web services to create data access solutions



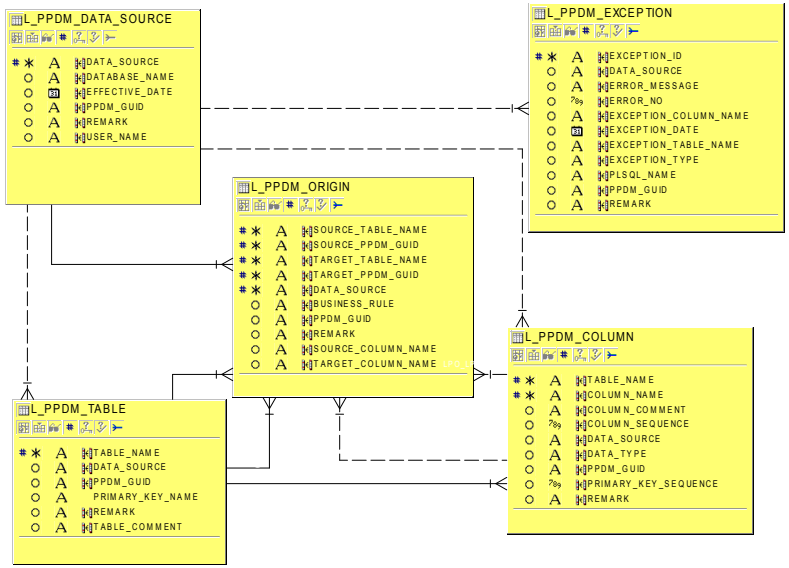
Suggested Improvements

- **Web access**
  - services for customised data access
  - browsers for generic access
- **Metadata**
  - document the data structure, make it more accessible
  - introduce more rigour in data repository and structuring
  - help other users and applications access data warehouses

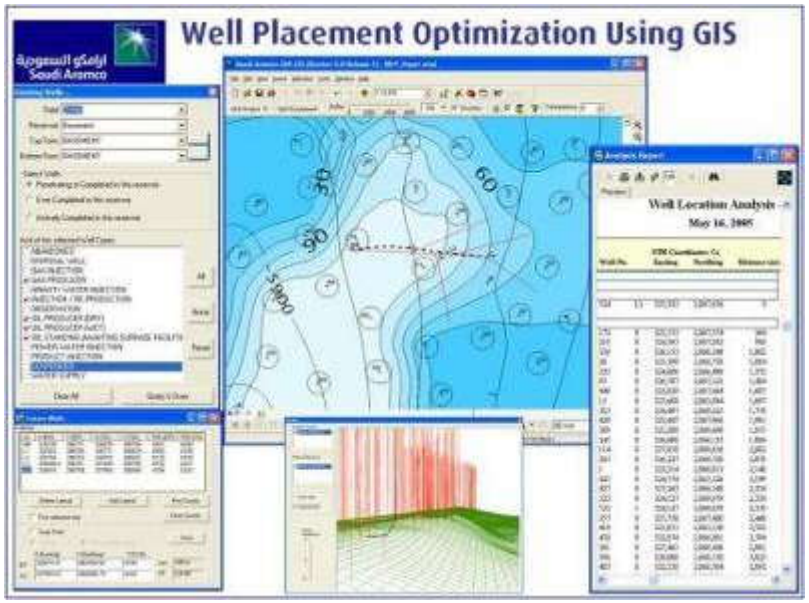


Suggested Improvements

- **Data models**
  - users and vendors agree on common data formats
  - help users maintain their corporate workflows
  - help vendors create applications to support same
  - access both new object and classic SQL2 data models



- **Applications**
  - end-users' own (GIS, G&G, EDMS, etc.)
  - vendors spatially enable their own specific data and applications
  - spatially enable geoscience applications with the above



- ***Business Rules!***
  - *users must drive the technology*
  - *workflows support/improve operations*

The Road Ahead

- Complete workflows / dashboards
  - push data from the desktop to servers
  - pull processing results from servers to desktop
  - integrate geoscience processes on the desktop
  - scale from desktop, through the web in remote offices, to handhelds in the field
- Access to third-party server applications
  - replace data import/export with direct-read in spatial servers
  - launch other applications on server and retrieve results in spatial desktops
  - *Business discipline*
    - *'if it doesn't fit the business, toss it'*
- Spatially enable workflow management
  - adapt spatial tools to existing geoscience workflows
  - merge non-spatial processes into resulting spatial workflows
  - deploy on desktop, server, web or handhelds as applicable

In Closing

- Enterprise systems can be implemented in oil companies when complete spatial workflows are made scalable to each relevant business scenario
- This in turn creates a data and application infrastructure that is spatially integrated
- Not only will it allow for better business process in Oil&Gas Exploration and Production
- It will also help better prepare and train for emergencies such as the US Gulf Coast hurricanes that are both seasonal and annual

Thank you

- Andrew Zolnai
- Cambridge UK
- aiz@zolnai.ca
- http://consult.zolnai.ca