



Leading International Seismic Acquisition Vendor and Services Company

Business Needs and Objectives

A leading international seismic acquisition vendor and services company wished to develop a Geophysical Information System for data management and order fulfillment to support their existing client services. These services, at their most generalized, involve the retrieval, packaging and delivery of petroleum seismic exploration data and their associated documents and metadata to the clients that request them.

Business Solution

The proposed solution consists of a product-architecture, technology recommendations, and a recommended software toolset. The solution consists of a desktop inventory and ordering system that uses a centralized Oracle geodatabase to store the relevant assets and business data. Access is provided through a variety of .NET / ArcObjects middle-ware layers (Data Access, Business Objects, Application and Functionality layers) that facilitate communication between the ArcMap user interface (user-friendly mapping and reporting graphical user interfaces) and the SDE enabled Oracle database. The resulting solution is a user-friendly desktop mapping solution, tightly integrated with an inventory control and order management system to allow the users to rapidly locate and package their business-critical data assets.

The solution consists of a combination of native ESRI tools and custom functionality written in C# capitalizing on the .NET Framework, coupled with an SDE-enabled Oracle database. The evolving computing environment of the company requires that the solution can be enhanced post-deployment, so at the heart of the application is a middle-ware layer referred to as DOF (Dynamic Object Framework). DOF is written in C# using the XML integration built into the .NET Framework. DOF allows the end user administrator to define the metadata of the inventory items to be stored within the system in an easily editable XML file. This information merges the data stored in the Oracle database with the object structures of each individual inventory item. The metadata information is read into a .NET Strongly Typed DataSet which allows the rest of the application layers in the system to easily retrieve and use new business objects defined by the system administrator.

The solution also uses a Wizard Engine built using .NET. The Wizard Engine has components that generate the user interfaces for the dynamically defined business objects at runtime. This allows the solution to have a consistent intuitive user interface even for business objects defined after the solution is deployed.

The ordering subsystem within the solution is implemented using a customized ArcMap extension written in C# merging the .NET Framework with the COM classes available in the ESRI ArcObjects library. The ordering system uses DOF and the Wizard Engine to determine the types of items stored in the inventory system and then retrieve the individual items available to an end user making an order.

Interventions:

ESRI GeoDatabase, ArcSDE, Oracle, ArcObjects, ArcInfo, SQL, PL/SQL, XML, XSL, XML Spy, C#, .NET

The storage aspect of the solution utilizes an SDE (Spatial Database Engine) enabled Oracle database with a data-model designed to promote a dynamic definition of business objects at runtime.