



OGC Delivers GI Interoperability And Industry Coordination

An Open GIS Consortium (OGC) White Paper

by Lance McKee
Vice President,
Corporate Communications
Open GIS Consortium, Inc.
lmckee@opengis.org

The Open GIS Consortium continues to work toward its vision of geospatial data and geoprocessing resources that are fully integrated into mainstream computing, and toward the widespread use of interoperable, commercial geoprocessing software throughout the global information infrastructure. Standard geoprocessing interoperability interface specifications --The OpenGIS™ Specification -- will be in place by July, 1997. Meanwhile, OGC's organizational innovations are creating new opportunities for geospatial information communities to tap into the expertise of commercial and academic technology providers, and the same innovations are creating new opportunities for vendors to gain understanding of the needs of these communities, and to make the users aware of their special strengths.

1 OpenGIS RFP Process Yielding Engineering Specifications

The OpenGIS Abstract Specification is holding up well under public review. A living document with some elements still under development, the "Abstract Spec" is nevertheless solid and complete enough to provide a model for detailed implementation, or engineering, specifications. These OpenGIS Implementation Specifications will be used by programmers to write interfaces that support geodata access and queries between dissimilar software systems with dissimilar data models. Vendors, working to keep up with a Request For Proposals (RFP) schedule that allows little opportunity for missed milestones, will soon submit Implementation Specifications for review and selection. Four final Implementation Specifications will be selected to implement this basic functionality on each of the four major distributed computing platforms (CORBA, OLE/COM, the Internet, and ODBC). By July of 1997, vendors worldwide will have a standard interface specification for "simple geometry" queries on each of these platforms.

A few months later, the first generation of cross-vendor interoperable geoprocessing software products will be working together locally in standalone systems and remotely across networks, accessing each other's data in real-time. Because these are open interfaces, this new level of interoperability is available to any vendor who chooses to make OpenGIS Specification compliant software that produces, stores, manipulates, analyzes, or displays geographic information. Different vendors' OLE/COM-based GIS systems, cooperating via interfaces compliant with the "OpenGIS Features Specification for OLE/COM," will, for example, service each other's requests for simple features and feature collections using fundamental selection behaviors such as intersect, union, subtract, complement, spatial buffer, and select by attribute, location or topological relation. In many cases, users will enjoy interoperability across CORBA, COM/OLE, Internet, and ODBC bridges, thanks to the Technical Committee's attention to this problem.

The public can view and download from <http://www.opengis.org> the OGC document detailing the RFP process: "OGC Technical Committee Technology Development Process." That document also describes policies that enable OGC to quickly standardize on existing technology that has been developed outside the consortium (the Request for Comment, or RFC process) and to formally solicit information from industry about particular technologies that might be under development (the Request for Information, or RFI process). A compliance and labeling program to be announced next year will set the rules that will determine how vendors' software labels will inform software buyers about the level of geoprocessing interoperability offered by OpenGIS Specification compliant software products. For an overview of the OpenGIS Project, see the earlier Technical Committee document titled "The OpenGIS Guide, An Introduction to Interoperable Geoprocessing," which is also available on the Web site, and is available in hardcopy.

The reason for making these documents public is to ensure that all interested parties in the geoprocessing industry know about this effort and have an opportunity to submit technology for review. The geoprocessing industry is growing beyond its traditional bounds. It now includes, for example, database vendors (whose relational and post-relational database engines and network servers are being enhanced to efficiently serve spatial data), telephone companies (who recognize the potential for geospatial services such as geo-enabled multimedia yellow pages), and visualization, simulation, and virtual reality tool developers (for whom the OpenGIS Specification makes heterogeneous geodata part of their data domains). Meanwhile, technical and commercial progress in GPS and high resolution Earth imaging are creating an explosion in geodata. Wide participation of technology providers and technology users is essential for implementing widespread interoperability.

2 RFIs Published For Imagery and Catalogs

When it released the RFP, OGC also released two RFIs, which are available on the Web site. One solicits information on available technologies and suggested interfaces required to imagery-enable geospatial applications and tools, and the other solicits information on digital catalog architectures, geospatial catalog requirements, and relevant technologies. The goal of the RFIs is to be certain that the OGC Technical Committee is fully aware of the entire industry's needs and capabilities related to these two technology areas, which will be addressed by subsequent OpenGIS Specification RFPs.

The OGC Earth Imaging Working Group (EIWG) that wrote the Earth imagery RFI has been working on the imagery portion of the OpenGIS Specification's Open Geodata Model. Among the EIWG's proposals is a proposal for a standard nomenclature for the definition of imagery levels for Earth images collected by imaging devices on airborne and spaceborne platforms. Data vendors' sometimes idiosyncratic use of diverse sensor-specific imagery level definitions has led to confusion among users, and a standard nomenclature is required for the open system approach to be successful. OGC is proposing a standard nomenclature for interoperability as a common interface standard, not a data standard to which data producers must convert. The goal is to have a nomenclature to which all other significant imagery level schemes can map. The nomenclature is based on a rigorous approach to the engineering mathematics involved in every imaging event: sensor characterization and calibration; platform location, view angle, and geometric calibration; post-collection photogrammetric geopositioning operations; etc.

Significantly, the proposal defines an imagery level encompassing all non-mapping images, including imagery products that have gone through image processing that does not involve the use of a photogrammetric math model or that otherwise does not allow for rigorous measurement of error propagation. In the EIWG's scheme, an image product lacking rigorous error propagation data can be used for various purposes, but it cannot propagate certified values for the accuracy fields of subsequent image or map product metadata.

3 New Strategic Membership Level Serves Major Information Communities

Technology providers and users in OGC have always had as their first goal simply the achievement of geoprocessing interoperability within the industry. If they don't do it, it won't get done. But every member has a specific set of business reasons besides that basic goal. Vendors are looking for particular kinds of sales, marketing, and partnering opportunities, and user organizations are looking for specific expertise and technology. By creating the new Strategic Membership level, OGC has amplified the opportunities for both sides.

OGC's first Strategic Member is the Geospatial Integrated Product Team (Geospatial IPT) of the US Defense Mapping Agency. This team includes members from all the US Government's national security groups concerned with geospatial information, and one of its chief tasks is to create a common architecture for future use of geospatial information in these agencies. The Geospatial IPT has a vision in which paper maps are superseded by a network of digital geographic information sources that provide a "geospatial framework" of up-to-date, accurate, overlayable, digital geographic information types that are universally accessible (within information security structures) over networks for analysis and display.

To help realize this integrated vision, the Geospatial IPT will use OGC, an open membership consortium, as its interface to the technology provider community. Almost all of the significant providers of geospatial technology are active members of the consortium. Strategic Membership enables a major user community to tap the collective expertise of the consortium in high level planning and "spiral development" procurement planning, including open facilities for prototyping advanced solutions to a Strategic Member's geographic information problems. Also, in OGC, technology providers and technology users collaboratively develop specifications that "steer" technology development in the domain of geoprocessing, which includes geographic information systems (GIS), Earth observation, automated mapping and facilities management (AM/FM) (a major issue for DoD), navigation systems, and other systems that produce, manage, and display digital geospatial data. By influencing and extending the OpenGIS Specification, a geospatial information community can ensure that its particular needs will be addressed by multiple vendors competing to provide finely differentiated but interoperable software products that address those needs. Vendors welcome the participation of major user communities because this participation gives vendors insight into important customer needs. In this information rich planning environment, a vendor can focus on opportunities that fit well with that vendor's strengths.

Through the OpenGIS Project and advances in GPS, Earth imaging, and spatial databases, government and private sector organizations and industry groups will soon have an extraordinary new resource - abundant, ubiquitous, richly varied, high resolution digital geospatial information

available over networks, automatically conforming its component layers in terms of spatial coordinates (to the degree of precision inherent in the component layers, which retain their lineage information). OGC is promoting interoperable geoprocessing to these user communities worldwide and encouraging technology providers worldwide to enter through the doors that the OpenGIS Project is opening.

*To maximize exposure of OGC's OpenGIS trademark, and to emphasize that the specification supports open access to geoprocessing resources as well as geodata resources, we have changed the official name of the specification from "Open Geodata Interoperability Specification" to "OpenGIS Specification." It is still referred to informally as "OGIS."