

Open GIS Consortium

Statement on the topic of curriculum content for
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Through a consensus process involving most geographic information technology stakeholder groups, OGC is assigning very specific meanings to a set of geoprocessing technical terms for the purpose of specifying the content, parameter ordering, well-known data types, etc. for geoprocessing software interfaces. This effort to enable disparate geoprocessing systems to communicate has broad implications for those who are concerned with educating geoprocessing stakeholders about geoprocessing technologies.

OGC is forging from parts of the established GIS, remote sensing, AM/FM, and geodesy traditions a new language for the expression and reception and construction of geospatial ideas. Reduced to its essentials, this language is an object model best expressed in UML (Universal Modeling Language). The entire object model is the OpenGIS Abstract Specification. Within the Abstract Specification we have topic volumes, but these will be replaced by folders, where a folder is a set of objects and interfaces. From folder to folder there are interfaces but they are few in number. We will need at least one book or chapter per folder, for: simple features, two-d geometry, 3 and 4 dimensional geometry, transformation services, catalog services, ordinary coverages, etc.. Each will lay out a language for the expression of ideas around that title. The language will consist of object names and interface names together with careful and precise definitions of what they mean and what they do, how they behave.

These books will be useful for both managers and programmers. Managers don't have to pay attention to data types and parameter sequences, but they do need to concern themselves with behaviors and how they fit together and what they mean to the enterprise. The OpenGIS object model is a language that programmers and managers can share. Managers may be corporate business managers, agency managers, or people vested with authority by professions and disciplines.

It is useful to consider an historical analogy: After the invention of the printing press, the very large number of local "farmer languages" in Europe became a much smaller set of languages which were book languages. The technology of books was necessary but not sufficient to achieve what books have achieved: great literature was also required. Great literature might be defined as information that changes the way you think: Dante, Shakespeare, Cervantes, and others defined Italian, English, and Spanish. Once you have a common language you have defined a people, a mission, a culture. We are talking about the world of geospatial discourse, which becomes enabled by great geospatial literature. This discourse depends on both the technology and the artist, the gifted writer who creates compelling stories. Arguably, most of the great geospatial literature hasn't happened yet because we are just now inventing the book.

The best of the geoprocessing software and applications to date are the early geoprocessing literature that will survive the transition to this emerging geospatial culture. Suppose it is the year 2048. Imagine entering into a geospatial virtual reality that enables you to experience the Mississippi River and its tributaries, with their component precipitation and runoff, leaching, pollution, treatment plant effluents, and flora and fauna. The geospatial "literature" will provide a

new way of seeing the Mississippi, just like Don Quixote is a new way of understanding the Spanish middle class and the end of feudalism. The geospatial virtual reality experience will change the way you think and behave, just like reading Don Quixote changed the way people thought about being Spanish. Who will the authors be? Today's geospatial works compare to little books like "Dick and Jane." We have flight simulators and fly-through technology, but these are still thin, lightweight, and they don't change the way we live. In 1300, reading was marvelous and magical to illiterate European peasants, but it was an essential part of the life and work of the educated elite who governed and who carried forward the tenuous thread of classical culture. Now reading is part of the life and work of most people. Similarly, digital geospatial information technologies are not widely used now, but they will be, and their content will be greatly amplified by new geniuses, new receptive audiences/markets, and the growth of traditions, standard usage, and branching styles and orientations. The broader IT industry is almost certain to supply ever more powerful supporting capabilities -- CPU speeds, bandwidth, portability, embeddability into information appliances, omnipresent Internet access -- which will meet the needs of the geoprocessing dreamers who will build the great virtual environments and applications.

OGC's purpose is advanced in general by everything that is done at all levels to teach people to think spatially and to understand the powers and limitations of GIS, remote sensing, AM/FM, geodesy, and GPS. At the same time, OGC needs educators to develop specific programs and supporting documentation to teach people about modeling spatial capabilities in software using the OpenGIS Abstract Specification Object Model. Object modeling has become an established part of computer science curricula in most universities. This is exciting in itself, because it introduces young minds to the idea that information flows and processing resources are extremely plastic, manageable, and adaptable. Designing information systems, which can be defined ever more broadly, is easier than before, and implementing from a design is *much* easier than before. It is exciting to geoprocessing stakeholders because OGC's work brings geoprocessing up to speed with the rapidly evolving IT mainstream. Academics would not serve their students by ignoring the opportunity to let them work with spatial object technology.

Also, university departments that are versed in the OpenGIS Abstract Specification (whether those departments are computer science departments or the departments in which geoprocessing is applied in another discipline) will be positioned to make important contributions to the evolving OpenGIS technology mainstream. There is much to do: OGC's technical agenda is ambitious, complicated, and long-term, and OGC provides an intellectual environment in which advanced students can both learn and contribute. Every application domain will benefit from the legacy left by those in the domain who set the OpenGIS Specification on a true course for that domain in the beginning. A student or faculty member leading such a domain effort will come into a central position in their discipline (for learning and potentially for leading) because of the need to understand and involve the domain's main issues and component communities and disciplines.

Is OpenGIS spatial object modeling a new discipline, or is it adequately addressed by existing disciplines? Certainly it has the cross-disciplinary character of GIS and remote sensing, but it deserves to be addressed separately, just as GIS needs to be studied apart from geography and remote sensing needs to be studied apart from imaging. The key objective should be to teach people about it so that they can partake as users, enthusiasts, and critics, and so they can perhaps take it into new realms.