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Where will the geospatial industry and technology be in 10 years?

Predicting the future is a difficult task often done by looking at the past—what Marshall McLuhan referred to as “rear-view mirrorism.” Although this is fraught with difficulties, it may help us judge the pace of change that we’re experiencing and reduce the overshoot or undershoot of our projections.

Roughly 10 years ago (1998), I began working on Geography Markup Language (GML). The objectives of that work were in no way revolutionary and simply reflected the desire to integrate geographic information as transparently as possible across all jurisdictional boundaries.

By the year 2000, the Open Geospatial Consortium (OGC) had its first major testbed (WMT 1), and the roles of data servers (later WFS), catalogs, geographic data linking, map styles and application schemas were all established concepts—largely because the concepts pre-existed in other forms.

Now, in 2007, we’re struggling with much of the same issues and challenges. There are, however, some significant differences that constitute “progress” from which we can build a prediction for the coming decade.

Some significant things have transpired in the last decade, including the emergence of open standards for data encoding (GML) and presentation (KML, SVG), open standards enabling geospatial transactions and data access (WFS, WCS), and, most importantly, commercial implementations of these by open-source and commercial vendors. What were concepts in 1998 now are fairly widely available components.

There have been significant business changes as well. The GIS industry has come to be dominated by a single company (ESRI), while, at the same time, the industry is on the verge of disappearing as a distinct entity as geographic information and information processing merge into existing industries.

This shift has been partially prompted by the emergence of open standards and deeper drivers for information integration, including increasing urban complexity, concern for security and the threat of climate change.

The GIS acronym won’t disappear, nor will we cease to develop technology that deals with coordinate referencing, feature geometry and other means of describing the world around us. The idea of independent GIS software components, however, will largely be history. GIS will be an embedded technology with the mechanisms for geographic-information creation, manipulation and management being just parts of products for urban-infrastructure design and management, advertising, entertainment, etc.

One of the rationales behind developing open standards has been to facilitate the ready integration of information about the world across different jurisdictions, vendor technologies and disciplines. I think this objective will be achieved in the next decade—not as a network of GISs, but as a loosely coupled network of application systems.

Open standards will be more “under the covers” in the same way that IP and HTTP are for the Internet. We will realize the GeoWeb in the coming decade, but it will be largely invisible—other than what it will enable us to accomplish at the application level.

GeoWeb integration will be especially important with respect to the global management of the built environment. With the exception of a few areas of the world, the boundaries between the urban and rural world will largely disappear. We will take a more holistic approach to design/build/manage, which will drive and be driven by the GeoWeb.

I don't expect that we will achieve complete transparency in terms of component integration. Standards will get us part of the way, and the rest will be "custom labor and bailing wire." As we come to understand the GeoWeb as permanent information infrastructure, it won't need to be a perfect "Lego block" construction to work effectively.

This also will be the case with respect to user-sourced information, which will become an important component along with the information developed by professional technicians. Working effectively will become the key issue, rather than having perfect standards and standards compliance.

Although we won't have flying cars, I think we will have fairly rich immersive environments that integrate real and virtual worlds. Cityscapes will move beyond "eye candy" and entertainment to form the basis of planning and common decision making. Our virtual world will enable new means of social and government interaction.

Will industry consolidation continue at its rapid pace?

The last two years were marked by a significant number of mergers and acquisitions, the most notable being Nokia's acquisition of NAVTEQ, Hexagon's acquisition of Leica, TomTom purchasing TeleAtlas and Pitney-Bowes acquiring MapInfo.

These acquisitions don't constitute consolidation of the GIS industry, but rather its absorption into application domains (e.g., telecommunications, vehicle navigation, logistics) for which geographic information is critical. I anticipate that we'll see further corporate acquisitions that reflect this application-domain integration.

Geographic information technology is an increasingly valuable component of many application domains, and this will drive further corporate integration in the near future. This can be anticipated in engineering design/build/management/maintenance with companies such as Autodesk and Bentley perhaps being absorbed by larger international engineering firms.

This also will be the case for transportation and telecommunications. We also may see integration across these domain boundaries with larger firms in advertising, entertainment, telecommunications and vehicle manufacturing.