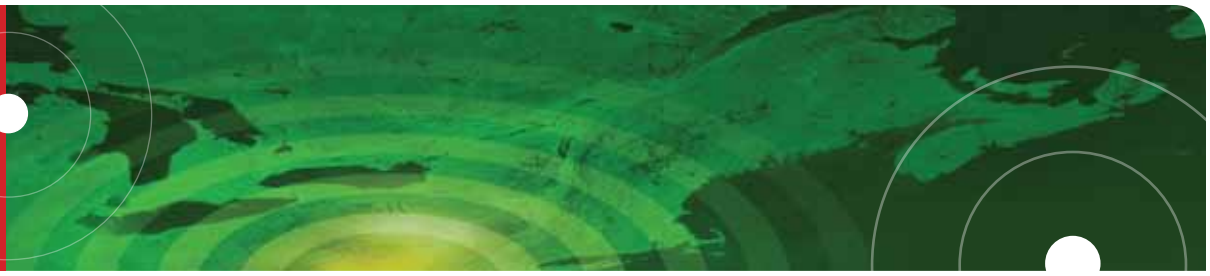
ON OUR RADAR



GEOSPATIAL SOFTWARE IS EATING THE WORLD

By Todd Stavish

Marc Andreessen, one of the most influential figures in Silicon Valley, famously stated in a 2011 essay, "Software is eating the world." Andreessen's belief is that we are in the middle of a broad technological and economic shift in which software companies are poised to take over large swathes of the economy. Essentially, no matter what industry you are in, software companies of all shapes are emerging to offer solutions to every business challenge imaginable. While Andreessen's assertion was primarily referring to Internet companies, the trend is true regarding geospatial software as well. A new generation of mapping startups is radically transforming both geospatial processing capabilities and the economics of the industry.

These new startups are taking advantage of three dramatic and fundamental changes in the geospatial industry. The first change is the rise of open alternatives: open source, open standards, and open data. The second major change is the ability to perform analytics at scale by utilizing low-cost cloud computing and machine learning to revolutionize geospatial processing. The final change is the democratization of user interfaces to enable non-technical users to perform basic geospatial analysis on their own, without the aid of highly trained and often expensive geospatial professionals.

The pattern of open source alternatives commoditizing entrenched proprietary software vendors has already been established in operating systems and databases. A successful open source geographic information system (GIS) needs to contain a relational database with geospatial extensions so that it can support geographic objects, an application server to publish data from major spatial data sources, tiling to accelerate the delivery of data, and a user interface.

Open source software companies offer both technical and economic benefits to their customers. Open source business models are oriented towards long-term and low-cost subscriptions instead of large licensing events that the proprietary vendors prefer. Open source companies are often able to offer equivalent functionality at a lower cost than proprietary vendors because they are able to coordinate software development teams worldwide with minimal or no direct expenses. From a technical perspective, open source architectures are extensible and support Intelligence Community customizations. For example, security enhancements that are required to work with classified data can be built into the architecture.

Open standards, on the other hand, ensure interoperability. The Open Geospatial Consortium (OGC) is the leading international consortium that defines geospatial interface standards. These open standards empower technology developers to make complex spatial information and services accessible and useful with all kinds of applications.

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The expansion of open data is perhaps one of the most exciting developments that has recently occurred for GIS analysts. The OpenStreetMap (OSM) project provides a crowd-sourced, free, editable map of the world. OSM was inspired by the success of Wikipedia and has grown to over one million users plotting location data worldwide. Proprietary map data tends to be sparse in developing nations because of the lack of commercial appeal to substantiate the cost. OSM, however, has very rich data in the developing world because of contributions from non-government organizations, map data donations, student participation, and hobbyist geographers.

The second major shift affecting the geospatial industry is the ability to inexpensively perform analytics at scale. There are a handful of geospatial startups that are using cloud computing to apply brute force computation and machine learning techniques to location data. The ability to process large amounts of location intelligence allows advertisers, for example, to understand consumer behavior and target mobile users with specialized ads. In addition, database companies are building geospatial extensions to perform geo-processing at scale on an organization's own datasets.

Democratization, the third major shift to the geospatial industry, has been driven by non-technical users' exposure to web mapping products like Google Maps. Web mapping has created an appetite for non-GIS analysts to perform their own basic map creation and analysis. There has been an emergence of startups with cloud-based data publishing tools that enable non-technical users to perform basic GIS analysis and generate their own maps with their own data. Technical users can also integrate maps into their mobile apps.

Historically within the Intelligence Community, geospatial data was considered a separate type of intelligence. This is no longer true. Geospatial intelligence is a part of all intelligence-gathering disciplines. For example, images now embed geo-tags, and collections have locations attached. Signals Intelligence requires IP address geo-location and triangulation of mobile devices. Open Source Intelligence analyzes social media with location data and utilizes crowd-sourced mapping. Location reveals what the data means, and in some forms of analysis, location may be the largest indication of intent. Q

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