Top 10 Disruptors
to Geospatial Business Models

BY MATT BALL / EDITOR / SENSORS & SYSTEMS

It's a time of great disruption within the technology space, with a great deal of change taking place in how geospatial data is collected, stored, visualized and analyzed. There are new technologies and new approaches that have allowed new companies to emerge, and that have empowered existing players. Much more disruption is on the horizon that individually or combined will make it hard for practitioners and vendors to plan.

What does disruption mean? The recent Nokia news puts business model turmoil in perspective as the company was valued at $250 Billion at the turn of the century and sold this past week to Microsoft for just $7.2 Billion. This age of disruption provides a means of great opportunity to reach more users and provide more insight, but also holds the potential to undermine the business plans of big players. Here and throughout this issue are some disruptive technologies that could re-write the geospatial technology marketplace.

1. UAVs

Surveyors are looking with some dread at these autonomous airborne vehicles that allow unskilled users to quickly map areas from the air with a great deal of detail with very little effort, often even using inexpensive consumer cameras. The largely automated flight planning and image processing software promises more real-time solutions, and could particularly re-write how the AEC (architecture, engineering and construction) community monitors projects under construction, and how farmers keep track of crops. There will be a great many service businesses and applications that benefit from these monitoring and mapping technologies, pushing broader use in yet untapped markets.

2. EARTH OBSERVATION EXPLOSION

There are many Earth observation trends that are making space more accessible. Several venture capital-funded organizations are set to launch commercial constellations for global coverage of both microsatellites and cube satellites, increasing the amount of available data and opening it up to more cost-conscious applications, while also undercutting established satellite imagery providers. There's also Iridium's hosted payload Iridium Prime that offers integration on a planned constellation of up to 66 communications satellites set to launch by 2017. And then there's speculation that Google's Project Loon balloon communication network may include Earth observation. Together, an era of affordable real-time space-based observation is around the corner.

3. INTERNET OF THINGS

The sensored devices and networks of the Internet of Things (IoT) promises a much better understanding of our world. IoT empowers such concepts as Smart Cities where we improve our management of resources and infrastructure based upon performance. With this performance-based monitoring, we will improve operations while also increasing our understanding of the impacts of the built environment upon the environment. New businesses are being created around this opportunity as well as new forays by large traditional players that see the computing demand of these networks as the next big storage and computing opportunity.

4. OPEN SOURCE

Open sources software have been making inroads in the geospatial marketplace for more than a decade, with quite capable tools, particularly in the online mapping space. With budget cuts and a reticence of being locked into long-term licensing agreements, the solutions are becoming more common in the government space, particularly with the military. The moves being made by OpenGeo make the choice more appealing with new funding, an increase in recruiting the top open source

minds, and a growing suite of tested software. Within the open source geospatial community there are opportunities for developers as well as integrators.

5. DEVELOPERS

The appeal of geospatial tools to the software development community is on the rise due to the accessibility. While this relates to open source, it's also an opportunity for those companies that offer software developer kits (SDKs) or application programming interfaces (APIs) to extend their products with custom solutions that are provided by skilled software developers. There has been an increased effort on behalf of Esri and others that see this community as an important extension that can build upon capabilities and return revenue via licensing the underpinning technology and data.

6. WEARABLE COMPUTING

Google Glass has ushered in a new era of mobile interface that could greatly assist field work. This platform has perhaps greater potential for streamlining operations, easing business communication, and improving on the accuracy and detail of geospatial data capture. One could imagine an RTK (Real-Time Kinematic) surveying system augmenting the location for very precise positioning, and improving our systems by orders of magnitude thanks to both this precision and the added context that we're able to capture with heads-up and hands-free devices.

7. 3D DATA CAPTURE

Today's LiDAR hardware does a good job of capturing a precise 3D reality from the air, from mobile platforms, and from stationary tripods from different perspectives and for different purposes. Point clouds generated from photographs are filling a lower-cost and lower-resolution niche, to make 3D modeling more ubiquitous. Together, there's a momentum to feed a model-based approach that blurs the line between BIM and GIS. While 3D hasn't yet become ubiquitous, it's an inevitable progression that is fed by augmented reality and the world's move toward greater urbanization. The need to capture details first in order to improve existing structures and infrastructure will only increase over time, and there are a number of opportunities here for new services as well as enhanced design and construction workflows.

8. CLOUD COMPUTING

GIS is increasingly being delivered via the infinite computing of the cloud as online solutions, custom services, and as the platform-as-a-service model. The cloud offers a much greater flexibility to GIS practitioners, which takes away the onus of IT control, allowing for greater flexibility and creativity while also easing enterprise integration with other systems. The cloud would seem to favor larger players that appeal to larger user organizations, having the potential to shut out those that can't scale their systems and data offerings to compete. There are nagging security and access questions that are still making some organizations wary to make the jump.

9. BIG DATA

Geospatial information is the original Big Data, and thanks to increased interest in other sectors that have amassed large databases, the geospatial community is set to benefit from new hardware, data analyses approaches and automation. At the same time, incredible amounts of new data are being created, meaning that an exponential advancement is needed. The full promise of Big Data advancements lies in our ability to better monitor global change and understand impacts. There's a great deal of opportunity here for individuals who understand how to massage this data to fill new job categories, as well as for vendors to fill gaps in analysis and decision support services.

10. AUTOMATION

Increasingly, our computing systems are becoming automated through the use of algorithms for automation, such as in the financial services community. As the bots take further hold, the power of the few to craft these prediction bots will likely lead to a backlash, and when even those who craft the bots can't understand their behavior, more insight will be needed. The ability of GIS to visualize and analyze reality in a transparent way gives it a leg up when this inevitable need to understand automation occurs.

There is an increasing interest in maps and mapmaking now, with wider mainstream awareness and interest in the benefits that digital approaches have lent to the age-old practice of cartography. Maps have the ability to quickly condense data in a visually meaningful way for greater insight. Each of these disruptions adds to our insight for better stewardship of our planet. Hopefully any disruptions will add to our understanding, improve the revenues and reach of the geospatial marketplace as a whole, and aid individuals as well as corporations and governments. ∧♂