Surveying Uncharted Territory

Digital map publishers are breaking new ground in a mobile world.


During the last few thousand years, mapmaking moved from drawings on the ground to cave wall engravings and then to print on parchment and paper. In a digital age, maps are continuing to evolve in how they're published, distributed and used. How will the next few years shape the next few thousand years? One thing is certain: Personal and enterprise map users are going mobile and digital, and the way they view and manage maps will dictate the geospatial industry's next transformation.

The new millennium has seen a noticeable shift in how maps are being distributed and sold. With Google Maps, portable Global Positioning System (GPS) devices and in-car navigation systems, map publishers must find a way to repurpose their inventories and adopt a new distribution model to stay relevant in a changing modern environment.

As we look at how similar industries, such as music, video, books and newspapers, have shifted their distribution methods from physical manufactured products to a digital format, we should consider how the map industry likewise must respond to customer demands. Although the paper map model is unlikely to ever disappear entirely, advancements in technology have led to the downfall of giants such as Kodak, Blockbuster and Borders in industries that quickly changed to suit mobile consumers.

Finding a Digital Footprint

Considering the recent digital revolution, what are the benefits and challenges map publishers face? One advantage digital presents is a new avenue of distribution and monetization devoid of printing, warehousing and physical distribution costs. The downside is competing with a host of new digital players that already have the attention of early mobile adopters.

This poses a challenge for commercial and government map publishers, as they strive to make their map products useful and desirable to their traditional users. Unfortunately, frequently used paper maps from well-known international publishers, such as the U.S. Geological Survey (USGS), National Geographic and Canadian map giant Mapmobility, aren’t easily adaptable to GPS devices or in-car navigation systems, as these devices use their own map libraries. Additionally, as new entrants, such as OpenStreetMap and the vast array of iOS and Android map apps, continue to emerge and grow stronger with free or low-cost content (see "Free Map Apps Deliver the World to Your Fingertips," page 21), traditional map publishers must focus on the strength of their millions of dollars’ worth of detailed map intellectual property and design. As a commodity, these are the things that put map publishers ahead of the game—the accuracy and currency of their content, the clarity and presentation of the design and the brand names associated with their maps.

Nowadays, map users have access to smartphones, tablets, computers, GPS-enabled devices and in-car navigation systems. All of these products have access to a library of maps exclusive to each device or operating system, but how useful are they to consumers on various platforms?

Competing on an Even Playing Field

In approaching the new model, map publishers have multiple options for repurposing inventory for digital use. One option is to create their own device to contain their maps and provide functionality to users. It’s a decision that might be taken seriously by larger publishers that have a breadth of titles and financial wherewithal to stand behind, but the costs of competing with the digital map providers of the world come at a high risk and require a significant financial commitment.

One company successfully entering this space is Hema Maps (www.hemamaps.com), Brisbane, Australia. Recognizing that its detailed and comprehensive recreational maps of Australia offer a map experience that can’t be rivaled by the likes of a Google Map, Hema Maps offers a way for users to download maps for offline use using their iOS device’s built-in GPS to track their location.

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Free Map Apps Deliver the World to Your Fingertips

From planning a journey using online maps and driving directions to fighting crime, Web mapping users are taking advantage of a wide range of low-cost and free apps on hand-held devices. Below are a few of the many Web mapping apps that are changing the way geospatial data are empowering users worldwide.

Esri
ArcGIS App
www.esri.com/software/arcgis/smartphones/arcgis-app

The ArcGIS App for smartphones and tablets extends the reach of Esri’s geographic information system (GIS) technology from the office to the field. Users can navigate maps, collect and report data, and perform GIS analysis using the free downloadable application. The ArcGIS App is part of Esri’s ArcGIS platform.

Maponics
Neighborhood Boundaries
www.maponics.com/products/gis-map-data

Maponics Neighborhood Boundaries is used by newspapers, direct marketers, realtors, social networkers and local search media industries to direct customers to relevant businesses and locations. Maponics creates and updates hand-drawn neighborhood boundaries for more than 17,000 neighborhoods in 220 cities around the world. Each neighborhood is built using data from multiple local sources to match reality on the ground.

Google
Google Earth and Google Maps
www.google.com/earth and www.google.com/maps

Google Earth is a virtual globe, map and geographical information program. Originally marketed as EarthViewer 3D by Keyhole, a Central Intelligence Agency-funded company acquired by Google in 2004, the program maps Earth by superimposing images obtained from satellite imagery and aerial photography. The product is available as Google Earth for Mobile.

Google Maps is a Web mapping service application and technology provided by Google that powers many map-based services, including the Google Maps website, Google Earth for Mobile allows users to view the same 3-D imagery, terrain and buildings available in the desktop version of Google Earth.

Google Earth and Maps embed a content layer in third-party websites via the Google Maps API. The technology offers street maps; a route planner for traveling by foot, car, bike (buses) or with public transportation; and a location for urban businesses in numerous countries around the world. Google Maps satellite images are not updated in real time, but rather they are several months to years old.

MapQuest
MapQuest and MapQuest Mobile
www.mapquest.com

MapQuest is a free online Web mapping service created by America Online. MapQuest provides some essence of street-level detail and/or driving directions for a variety of countries. Users can check if their country is continued on page 22
available via a pull-down menu on the MapQuest home page. Other services include a world atlas and MapQuest Mobile, which provides maps and driving directions to any Web-enabled mobile phone or personal digital assistant.

**Microsoft**

**Bing Maps**
www.bing.com/maps

Bing Maps (previously Live Search Maps, Windows Live Maps, Windows Live Local, and MSN Virtual Earth) is a Web mapping service provided as a part of Microsoft’s Bing suite of search engines and powered by the Bing Maps for Enterprise framework. Users can browse and search topographically shaded street maps for many cities worldwide. The service’s Aerial view overlays satellite imagery onto a map and highlights roads and major landmarks for easy identification. A bird's-eye view capability displays aerial imagery captured from low-flying aircraft. Bing Map Apps, a collection of free and third-party applications, add additional functionality and content to Bing Maps.

**OpenStreetMap**

**OpenStreetMap**
www.openstreetmap.org

OpenStreetMap is a collaborative project to create a free, editable map of the world. Created by Steve Coast in the United Kingdom in 2004, the project was inspired by the success of Wikipedia and the preponderance of proprietary map data. Since then, it has grown to around 300,000 contributors, who collect data using Global Positioning System (GPS) devices, aerial photography and other free sources. Rather than the map itself, the data generated by the OpenStreetMap project is considered its primary output. The data are available for use in traditional applications, such as its use by Craigslist and FourSquare to replace Google Maps, and more unusual roles, such as replacing default data included with GPS receivers. The data have been compared favorably with proprietary data sources, though data quality varies worldwide.

**Polaris Wireless**

**Altus Mobile**
www.polariswireless.com/altus

Altus Mobile provides government agencies with an advanced application suite to identify and track targets/suspects with software-based location accuracy. Altus enables government agencies to perform mass surveillance of wireless subscribers, monitor sensitive geographical areas, and analyze the historical movements of targets and suspects.

Altus Mobile lets law enforcement personnel track suspects or their cellphones, numbers or mobile equipment identities.

**Ushahidi**

**Crowdmap**
www.crowdmap.com

Crowdmap is designed and built by the team behind Ushahidi, a platform that was built to crowdsourcing crisis information. The platform serves as an initial model for what has been termed "citizens mapping," a combination of social activism, citizen journalism and geospatial information. As the platform has evolved, so have its uses. Crowdmap now allows users to set up their own Ushahidi deployments without having to install it on a Web server. Since its release in 2010, prominent Crowdmap deployments have documented the global “Occupy” protests and the 2011 London anti-cuts protest.

Centralizing digital map distribution could be the key to leveling the playing field.

Electronic distribution system to facilitate the transaction and deliver the maps. Think of it like iTunes, iBooks or Kindle for maps. Any georeferenced map can be uploaded to the system and made available for purchase electronically, similar to the way in which music, videos, books and apps are currently sold and delivered.

PDF Maps also offers the ability to add maps to an on-board map library directly. Large enterprise users can load their own map-related content to mobile devices and enable true paperless use of their specialized use-specific maps in a disconnected environment.

This ability is being used daily by organizations such as the U.S. Forest Service firefighters, the U.S. State Department, and various mining and exploration companies that have a need to carry around dozens of specialized and proprietary maps on electronic devices.

So what does all this mean? Whether on a car's GPS, a phone's Web site or on an iPhone, maps always will be needed and used. All that needs to be done is that those in government, business and academia who create, design and publish maps simply grow and change with the times and repurpose their content to address new use and consumption models.