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Google Earth The Redux: Global Organization

By Mark Szymanski

Many of us who grew up in the Pre-Internet Age and loved learning have fond memories of paging through encyclopedias and reading randomly selected entries about places and people we had never heard of, and spinning globes to learn about countries and mountain ranges far from our homes. Occasionally I played a game where I spun the globe and stopped it with my index finger landing on a random place. Immediately after, I would reach for the encyclopedia and look up the city, country, body of water, or mountain range the finger rested on. The entries were laced with declarative facts and perhaps a chart or black and white thumbnail photo. Did you know that the Amazon River is the largest river in the world and the volume of the flow is greater than the next ten largest rivers combined! For full disclosure, I just looked that up on Wikipedia, which required ten seconds of time and a lot of restraint not to click on the hyperlinks and the beautiful satellite image in the entry.

Fast forward to 2010. I’m sitting with my daughter reading a National Geographic article about water on my iPad and she has a question about the Amazon River. She immediately touches the icon for the Google Earth App and quickly, using her fingers, spins the virtual earth to South America and stops it with her finger planted on the Amazon River Basin. She selects the National Geographic Wikipedia layer and zooms in closer to access the featured information about the Amazon River. When she clicks on a place-mark, a balloon pops up that contains an encyclopedia-like paragraph with images, videos, and links to Web Sites.

Google Earth has become a geographically-organized encyclopedia which stands in stark contrast to the alphabetically organized older versions of our childhood and the newer topically organized Internet-based Encyclopedia Britannica [1]. This is yet another example of how our Internet-based environments and tools, in this case Google Earth, allow us to organize knowledge in a way that facilitates exploration into the depth and complexity of a topic. When Google Earth was released in 2005 (yes, five years ago) and in its first phase of development, people were initially excited by what you could see. Stitched together satellite images gave
people the chance to be transported to virtually anywhere on earth—virtually. I watched in my classes as students (future teachers) visited places they were most familiar with: their current homes, places they had lived, and other places they had visited. Getting them to think about how to use Google Earth as a learning environment was a challenge, but at a basic level they could now retire the pull down map and use the virtual globe when they needed to. And the wow factor they experienced certainly provided momentum and an indication to me that we were on to something.

Maps and Globes: Layers and Real-Time Geographic Data

The next phase of development for Google Earth was highlighted by efforts to include layers with additional information. This gave the user control over the amount and type of information they wanted to see, like borders, highways, and labels for geographical features. The concept of adding layers to the map that had information made sense to those of us who were able to connect it to the idea of using an overhead projector with a map and layering transparencies with different graphic information that added more information about the map. This was still not an encyclopedia, but sort of a mashup of a map and a globe and a step in that direction. The layers really gave more detailed information about geographic features. Because Google Earth lets you control the altitude from which you view the earth—to zoom in and out—the level of detail is scalable and clearly something that is impossible to do on a physical globe. This was the beginning of the ability to add content; even if it was static, it allowed more depth and complexity to be added to the mix.

The next phase of development, adding real-time data to the layers, was a fundamental shift and added the next great notion that not only could we see what any place on the earth looked like, we could see features of the area in real time. This was made possible because sharing of real-time data began to spread over the web and Google Earth content could be created fairly easily using KML and HTML code. Whether it was foresight or luck, perhaps a bit of both, Google positioned itself for open source development of content. For example, the United States Geological Survey (USGS) created a layer called realtime earthquakes that accesses a database of the recordable earthquakes and maps the information in a kml file to create a layer for Google Earth. When you click on that layer, you can see where and when earthquakes have happened within the last 30 minutes, hour, day, and week. The pedagogical power of this layer is to show students that earthquakes are happening all the time around the world as the earth’s plates move in small increments and helps them understand how increasingly powerful earthquakes are the result of potential energy being stored in the plates.

Another example is real-time Weather layers. My daughter’s class was following The Iditarod Trail Sled Dog Race online and I came in to teach a geography lesson using Google Earth. A student asked if I knew what the weather conditions were like for that day’s race. With the Iditarod course map layer already on the earth, I clicked on the cloud and radar weather layers and we saw the real time conditions and speculated about the next day’s race based on the position of the clouds and the patterns of movements we were seeing. The students, second graders, were
fascinated, but being children of the Internet Age, it seemed to make sense to them because it reflected their developing understanding of how knowledge is organized and immediately accessed in their world. What made this special was not just the up to date information; it was that information was also represented in a real way. It was real-time data used to render and represent real images of clouds in the sky at the moment.

**Encyclopedias and Globes: Multimedia Balloons and Crowd Created Content**

In the past few years, the number of Google Earth layers full of multimedia rich content has rapidly increased and reflects the current phase of development. This is a direct result of two phenomena. First, the increased amount of content on the web and the Web 2.0 ways in which it is accessible, and second the ability of organizations and common crowds of people to create layers and make them accessible to the world. The newer layers have place-mark balloons filled with encyclopedia-like entries designed to give digestible bits of text and multimedia to viewers with hyperlinks to Web Sites that provide another level of depth and complexity. For example, the Cousteau Ocean World layer has place-mark balloons that mark important locations relating to wildlife conservation. One place-mark on this layer identifies a spot where sea turtles hatch on Europa Island. When you click on the place-mark, a balloon opens that contains a paragraph describing sea turtle hatching on the island, a one minute video of the sea turtles hatching that plays right in the balloon, and a link to the Cousteau Society Web Page with a story on the sea turtles.

They key to making all this work is the Web 2.0 way everything works behind the scenes. The place-mark balloons are created using html code. Anyone can make a layer, save it and share it on the web. The layers and the balloons hold no content other than text and code so the files are very small and easily served out. The video in balloons plays using the embed code of the video. As a result, it’s fairly easy to create place-mark balloons if you have the content uploaded and linkable or able to be embedded. The Wikipedia layer works the same way by pulling information from Wikipedia into the balloon. If you geotag a Wikipedia entry, it will appear as a part of the Wikipedia layer in Google Earth.

In addition to the layers included with Google Earth, many people are creating their own layers and posting them for people to download. Students are creating them for projects and assignments in their classes, and groups of educators are creating layers to support content across the curriculum. One example is Google Lit Trips. The Google Lit Trips Web Site was developed to support and serve out Google Earth Layers (kml files) created by teachers and students to support teaching great literature. The layers organized by grade level and labeled with the titles of the books they are meant to support. Anyone can download the layers, which contain place-mark balloons that give multimedia information about a particular place in a story. For example if you download the kml file for John Steinbeck’s Grapes of Wrath, you see place-marks that identify important places in the story of the Joad family that travels west after losing everything in the Great Depression.
The teacher who created the layer, Jerome Berg, uses the place-mark balloons in two ways. First he uses them to enrich the reading with multimedia content. The balloons have historical photos from the era specific to the geographical location of the place-mark and links to Web Sites with additional information. Second, he embeds questions that require students to think in more deep and complex ways about what they were reading. In the place-mark balloon that identifies the location of the Joad family home they lost to the bank as a result of the dust bowl, he asks a questions that prompts students to think about symbolism in the story: What characteristics of monsters does Steinbeck associate with banks? This also creates an opportunity to guide student’s thinking as they read through a new piece of literature. It is as, he states on his site, an experiment in teaching great literature.

As the Internet continues to grow by simply connecting more and more computers and servers, the task of organizing knowledge still falls to the people. In just five years, Google Earth has unintentionally morphed into the gathering place for a new geographically organized encyclopedia and a place to go virtually anywhere we want to go and learn more about it in an instant. And thankfully, you can still spin the globe, stop it on any random spot with your finger, and find out about that place.

**Endnotes**


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9 THOUGHTS ON “GOOGLE EARTH THE REDUX: GLOBAL ORGANIZATION”

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