

Google Maps as an ASDI Viewer

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There is a lot of hype about Google Maps and Google Earth these days. Some people are asking the question 'why can't our GIS implementation be this easy to use?' Some people are even suggesting that Google will leapfrog the need to establish a Spatial Data Infrastructure (SDI) all together. It occurred to me that a review of what Google Maps is and how relevant or useful these products are both to the GIS aware people and the broader community is over due. Its also interesting to step back to get this in some commercial perspective – why is Google and others investing so much in making spatial data available at such a relatively low costs and with such good response?

Google have two freely accessible online mapping solutions or products currently. However, Google Earth is a three dimensional application based on spherical coordinates that requires the user to download a fat plugin to your PC. This is not a problem for some people but for the web developers who want to build applications for low specification browser based platforms (thin clients) Google Maps is more likely to be the preferred choice. There is no setup effort for an end user to start using Google Maps and applications builders like to keep things simple. Therefore, I have focused only on Google Maps here.

When the ASDI is finally operational (some people argue if) as a collection of published, distributed fundamental data services and geo processing services, there will follow an era of applications development that will produce any number of new value added web based services. These applications and component services will be available to a market greater than the geospatial niche we all belong to these days. The requirements for such applications will themselves come under a significant pressure to be more scalable, reliable, interoperable and far less complicated to use than traditional web mapping solutions that we currently use.

Google Maps is a fantastic example of how a client application can be developed with these new criteria in mind. This product is now being used by many web builders and 'hackers' to develop specific application for their customers. Some are brand new applications and others simply integrate a Google Map into an existing web site. So it is not a stretch to ask the question - if Google Maps is such a robust and data rich client platform, why can't I use it as a generic client and overlay other data not hosted by Google? Well the answer is absolutely yes.

In fact Google encourage you to do so. They have published their Application Programmer Interface (API) which is a library of javascript software components that

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that allows a web application developer to configure a Google Maps application and overlay their own data layers as markers and/or polylines. In the US and Canada they have implemented enterprise access fees but not yet in Australia. For any public facing free website there is currently no charge, however, they will advise that in the future Google Maps could come with advertising that you will not be able to avoid. So the future is a little vague regarding licensing/royalty costs and do we all want to advertise other people's products on our web sites?

In some other countries, Google Maps also provides geocoding web services – this service is not yet available in Australia from Google but presumably that will come in time. The availability of an online web service to transform an address into a geographic coordinate is fundamental to spatially enabling the broader community. An address is a ubiquitous piece of data for many organisations and the community at large. In Australia, almost all legal addresses can be geocoded and therefore can be located on a map. There are several Australian companies providing this service based on PSMA's G-NAF data set.

There are literally thousands of web programmers and hackers out there building applications with Google Maps. Real estate companies use it to show where their listings are, Insurance companies can use it to plot incidents, financial company can plot their customer locations and correlate with product usage, etc. - there are no bounds to the applications that are possible. However, when you start to scratch below the surface there are some serious limitations that need to be considered. For example, Google Maps data is a limited set that is not complete by any means. In Australia, they publish the road network symbolised differently at various scales, some of the topography, the cadastral boundaries and satellite/ortho imagery. An excellent base of data but what about the hundreds of other layers out there that may also be of interest such as geology, vegetation, agriculture, topography, census statistics, oceanographic, environmental, dynamic data like weather systems, etc. These data sets will most likely be published and accessible via the ASDI and not centralised by Google and integrated into Google Maps. So how can Google Maps interface with these data sets in the future?

When working in the Google Maps mashup (a mashup is a web application that is made up of two or more published web services) community you quickly realise that you are not alone. Not only do you have online help from an army of similar (some say sad) souls out there, you also have access to any number of freely available snippets of open source software that you can pick up and integrate into your application – reinventing the wheel in a lot of cases is simply not necessary. One such area of free software is the availability of javascript APIs for OGC interfaces. A programmer can use Google Maps with its base layers as the viewer and overlay data fetched from published Web Mapping Service (WMS) resources which includes access to raster and vector layers. OGC as an interface standard in the building of SDI's is virtually mandatory or will be in the future. So Google Maps can definitely be a client map viewer that can access the terabytes of data held in the emerging SDIs around the world.

By way of example have a look at the demo I developed to demonstrate one application that does in fact do this. <http://www.cubewerx.com.au/DemoDrapes.html>. In this demo I have used Google Maps as the viewer and overlaid the ABS Mesh Block data and coloured according to the attribute called CATEGORY. This layer is simply not available to the Google Maps user as standard but with the OGC interface you can layer data this way



and render it in accordance with any supplied attribute. I have also used a third party geocoding web service to locate any legitimate Australian address which is also not available to Australian standard Google Maps users.

So Google Maps can now join the ranks of many different third party application development frameworks that allow web developers to access published data and web services that will incorporate the ASDI. It has its strengths and weaknesses like any other option. For example, its performance is quite extraordinary when you consider how many people could be using it at any given time. Then again you have to realise that Google are redefining web scalability with somewhere between 30-50 clusters around the world and each configured with approximately 60,000 CPUs with significant replication they have the largest massively parallel processor on the planet to service their 40 million searches per day – impressive!

But why is Google investing the hundreds of millions of dollars in the Google Maps/Earth phenomenon? What is their ultimate motive? Well I have a theory that there are a couple of reasons that do make good commercial sense.

Firstly, they operate in an advertising revenue model the success of which is directly linked to the quality of their content. That is, get good content (like Google Maps/Earth) and you attract more visitors and once you can prove you are attracting more visitors you can sell advertising to many different organisations wishing to reach new markets. Anybody building Google Maps applications will one day see advertising appear as part of the service which may or may not be acceptable. It is also arguably true that to attract this traffic they really do not need to keep the data as current as it should be. So it will be interesting to see how frequently they will update these data sets given they now have global coverage to one degree or another.

Secondly, these are changing times, through the use of these free services (for now) we are becoming comfortable with the renting of functionality via web services. Google are pioneering other web service based products as well (Gmail, GCalendar, Gspreadsheets, etc) and are in effect resurrecting the old Application Service Provider (ASP) model. This trend will continue as they may be the market leader today but there are many others starting to emulate this model. The only barrier is the market place's acceptance of the ASP model versus desktop product licensing model. It is clear that their real end game is to compete with Microsoft's license product revenues such as Office? There could be a compelling reason for an organisation to wean itself of the license cost and version management nightmare if they were comfortable with renting computing functionality at a monthly fee.

These two factors plus the fact that Google have themselves pointed out that they see Google Earth and Maps as vehicles to deliver and present other information content via the internet (eg videos, images, documents etc), indicate to me that Google is really not interested in building a global SDI they are after far bigger fish. However, their Google Maps is clearly a valid viewing platform option that can interface with the terabytes of data held across the world in SDIs. Whilst, I would like to see a Google generated and supported OGC API library that was freely available and configurable for it to be a lot more efficient, I for one will continue to use Google Maps as an easy to use viewer to help promote the concept of SDIs.

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