

Intelligent Web Maps

Jack Dangermond's keynote at the 2011 O'Reilly Where 2.0 conference describes intelligent web maps. These maps blend together multiple services, such as data and analysis services, and are easily sharable on any device.

<http://video.esri.com/watch/283/intelligent-web-maps>

Video Transcription

00:03 What Jeremy and I are going to talk about are intelligent maps and cloud-based GIS...

00:08 ...something we've been working on at Esri for some time.

00:12 But I'd...I'd like to start off giving a little bit of context which is about our users.

00:16 We have about 350,000 enterprise organizations who use GIS software, and they work on all kinds of location problems.

00:26 They are not so personal specific.

00:29 They're more associated with this list, things like business efficiency or conservation or land-use planning...

00:36 ...or making cities more livable, organizing and optimizing for logistics, those kinds of things.

00:43 I'd like to simply say it's taking location beyond just a dot on a map or a pinpoint and...

00:48 ...getting into the meaning of geography and how that affects how we run our institutions.

00:54 In the last few years, these trends are beginning to really come together nicely.

00:58 And this conference, thanks to the O'Reilly organization, have really tried to focus it.

01:05 Trends in computing and networking, getting faster, now going to cloud, increased measurements, data capture...

01:12 ...sensor networks, now crowdsourcing, a new form of geospatial data.

01:17 The software's getting easier.

01:19 It's moving to the cloud.

01:21 It's more interactive.

01:23 It has more analytics inside of it.

01:25 Also the science behind the software, the sort of GIScience, is maturing.

01:30 Geography as well as all other fields are bringing about better understanding of how the world works.

01:35 And finally, especially in this administration and now spreading around the world...

01:40 ...more open-data policies are allowing the world to see the world, in other words...

01:46 ...creating a greater consciousness about geography and how it really works.

01:51 From a technology standpoint, GIS is implemented in multiple patterns.

01:55 There's the traditional enterprise pattern of desktops and servers and federated systems, Microsoft, Oracle, IBM...

02:03 ...are the sort of founders of those patterns, now moving to the cloud with access by everyone is the big step.

02:12 Cloud platforms are emerging as we saw from the Google presentation this morning and what we're going to show you here as well.

02:21 The web cloud pattern for us is a pattern that allows us to connect everything, the easy, powerful desktop...

02:31 ...mobile web clients to the enterprise servers and now cloud services that can support mapping...

02:40 ...and visualization and data management in the cloud.

02:43 In other words, linking the authoring and using crowd to the cloud, that sort of notion.

02:52 Geospatial services are the foundation to make this work, delivering pervasive maps to everybody...

02:59 ...maps but not just maps, also visualization and analytics and some of the things that can go on in the back office through servers.

03:09 We've been working on a concept called intelligent web maps which are a new medium.

03:15 They actually blend together multiple services, data, analytics, and publish them in a form that can be shared easily.

03:23 They're editable, they're viewable, of course, visualizable but also they run analytics in the background...

03:29 ...and we'll look at some of those examples in a minute.

03:32 These intelligent maps can actually go anywhere.

03:34 They can be, of course, services but they can be looked at in an Android phone or in an iPhone or a Microsoft Windows Phone.

03:44 They can be looked in a browser.

03:45 They can be embedded inside of a website, all those sorts of things.

03:49 Social media and real-time feeds are part of these intelligent maps.

03:54 They actually deliver just in time or dynamic services, and they're creating interesting opportunities and also challenges.

04:01 How do we blend together authoritative source with this real-time dynamic data?

04:08 Last year we announced something called ArcGIS.com at this conference.

04:12 It now has millions and millions and millions of maps that are made a day and tens of thousands of services and datasets...

04:20 ...that are in a cloud environment that people are using and exchanging.

04:23 They have basemaps and content and, and they're, and this summer we are introducing, hosting...

04:31 ...that is, being able to author a map on a desktop, send it over to the cloud...

04:35 ...turn it into raster cache or feature services and servers and serve it back to our users so they don't have to buy a server.

04:44 They can blend cloud stuff with enterprise stuff.

04:48 For you, what we wanted to tell you is that this is also an interesting platform for developers.

04:53 It has open APIs, templates, things to actually use.

04:56 But rather than going into this, I'd rather actually just have Jeremy really show it in a series of simple demonstrations.

05:04 Alright, thanks a lot, Jack.

05:05 As Jack said, there thousands, tens of thousands of maps in ArcGIS Online.

05:10 These maps tell powerful stories like this recent imagery map in Japan after the earthquake.

05:15 We also tell other stories, you know, socioeconomic stories like the access to supermarkets in your neighborhood.

05:22 More geographic stories, you know, what's the soil around you?

05:26 Or even related back to the oil spill from a year ago.

05:29 We're nearing in on that date.

05:33 I'm going to open up this map and this is going to be a temporal view into this, into this web map.

05:38 So we're seeing the oil spill animate through time.

05:40 It's not just that I can move the map around, but I can also just animate temporally.

05:45 This is a very powerful concept.

05:46 You see how dynamic this map can be.

05:50 Another aspect of these maps that Jack talked about is the ability to be able to share them and then view them in various applications.

05:57 So we have a gallery of template applications that you can just pick and use.

05:59 They work with these maps.

06:00 One that we just wanted to show that we put together recently is to integrate social media.

06:04 So it takes that map that you've been looking at then integrates with something like Twitter.

06:09 So I go look for Tweets related to the oil spill.

06:12 And this is a very powerful way to integrate something that's coming in real time.

06:15 You know, hitting directly the Twitter API on top of some map that gives you a story.

06:24 Another map that tells a story is this map of census information.

06:26 So I can touch this map, this is dynamic, it's for the whole US.

06:29 And I can get detailed information back.

06:31 I don't just raw data because that's not very useful, but authored information like the houses by income level.

06:37 We can take this map and drop in another one of these templates like this is something we call a side-by-side template.

06:42 Lets you compare multiple maps at the same time.

06:45 What's interesting is that they're all linked together.

06:47 So in space and scale, these maps will stay coordinated.

06:51 So I can look in the same area across three different intelligent maps.

06:54 It's really a different way to look at kind of the mashup, instead of just pushing it all into one, let's spread it out across multiple.

07:02 Another interesting thing is that analytics are getting faster and faster.

07:05 So in this example here, I'm just moving my mouse along.

07:07 I'm accessing gigabytes of street data, generating drive times, and then using that polygon to then go back and then query...

07:16 ...census information out of another service, pull them back and generate an age graph.

07:20 It's amazing where the technology is today, both on the client and on the server with the modern browsers.

07:25 Well, let's just see how hard it is to actually make a map, or actually how not hard it is.

07:29 First, you start off with a basemap.

07:30 We have a gallery of basemaps that you can work with, whether it's with Microsoft...

07:34 ...or the great work of the OpenStreetMap community.

07:37 And then also we have our own set of basemaps like this topographic map which is an authoritative...

07:42 ...collaborative venture that we have with our users, so they're pushing data in.

07:47 So I have the goal of making a map about seismic hazards in Southern California...

07:51 ...specifically the nuclear, relation to nuclear sites.

07:54 So we'll just look for some data.

07:58 Alright, found my nuclear plants, something like earthquakes.

08:07 See the active hazards from the Pacific Disaster Data Center, see some faults from USGS...

08:15 ...and then I'm going to add one more.

08:20 I'm looking a tsunami risk zones, and we've got all those added.

08:24 Let's switch it over to the legend so we can tell what we're looking at here and zoom in to Southern California.

08:31 This is a very powerful map, tells many stories actually.

08:34 So in the blue zones here, this is the areas of the land that are at risk for inundation zone, inundation after a tsunami.

08:42 We have all of the fault information.

08:43 It tells you how...where you are in terms of the fault lines, the active hurricanes, and then also the nuclear plants.

08:50 But I can...I don't have to stop there.

08:51 I can then go ahead and sketch and edit into this map because maybe I want to highlight a particular feature.

08:58 So this editing is going to be stored.

09:00 I'm editing a feature that's going to be stored with this map or it could also be stored in a server so it can be accessible by anybody.

09:07 I'll just tweak the view a little bit.

09:13 Alright. So now I'm done.

09:14 I want to go ahead and save this map out.

09:22 So now what we're doing is taking all those services, generating one intelligent web map that we're going to publish to the cloud...

09:28 ...host online for you.

09:29 Now it's only accessible to you unless you choose to share it out to everybody.

09:32 But in this case, I do want to share to everybody and add the goal of actually just putting it into my blog.

09:46 Then we can view that map that we just authored.

09:48 This is very powerful.

09:49 I mean, we want to make...we want to make intelligent maps easy to create and then easy to be able to share out with everybody.

09:55 It's not something that's supposed to be difficult.

09:59 Another area that we're working on is looking to make it easier for you to get your data into these intelligent maps...

10:03 ...either through hosted services or just something as simple as a CSV file.

10:07 So this, this is a little demo at...find my CSV file.

10:13 I have some restaurant locations.

10:14 Just going to drag it over onto the map.

10:16 This is simple HTML JavaScript application using a HTML 5 file API and then I go ahead and save it.

10:30 So now we're taking that, or reading into that CSV file.

10:33 We're packaging it up, creating one intelligent web map and then saving it online.

10:36 So now if I go back and see what the recent maps are that are available for us I should, hopefully...

10:42 ...see that map that we just authored and then, boom, I can go ahead and share this map out with anybody...

10:48 ...and it's not just the graph, it's also the features and the information behind it.

10:52 Finally, almost finally, Jack talked about we're moving to hosting not just simple features but hosting cache services for you.

11:01 So one of the big things that people don't want to is they don't want to have manage servers on their own.

11:04 They don't want to have to work with the network IT guy with his white sneakers.

11:08 So this is an example of a map that's authored exactly in Desktop.

11:10 And then all I have to do is just publish this button, and whatever I author in our Desktop software, whatever symbology...

11:15 ...whatever labels, whatever multiple scale dependencies that I might set to tease out the information where it's appropriate...

11:22 ...is going to be packaged up, pushed to the cloud, going to generate tiles from it, and then we're going to serve it back out as a service.

11:29 In the interest of time because I'm getting kind of low, I already did that, and we can see that service here...

11:37 ...excuse me, that map here.

11:39 Multiscale, multiple levels of detail, all packaged up on the desktop exactly how you authored it...

11:46 ...and then publish and host it for you on the server.

11:50 Finally we want to take just one more look at an application that maybe...

11:53 ...basically combines everything that we just talked about and lets anybody analyze the community.

11:59 So this is an application that's San Francisco crime mapping.

12:02 So lets you explore patterns in your community.

12:04 So I can pick a particular date and time range.

12:06 I can say, well, I'm just interested in the nighttime crimes, then I can create hot spots.

12:10 This is bring some of those geospatial analytics into the mix.

12:13 We're not just creating heat maps.

12:15 We're taking into account the level of violence for each of those crimes and generating hot spots...

12:21 ...not just based on location but based on the attributes that are in those features.

12:25 As we can see, we can tie in other sources of information on top of that.

12:28 So I can touch this hot spot, and I see that this particular area has a very low household income...

12:34 ...compared to the rest of the state, local, and county, much higher unemployment rate...

12:41 ...and a much higher high school dropout rate.

12:43 So we showed you a lot of things here where we've combined many...showed you a lot of demos.

12:49 We just wanted to get you the...get across to you that we're alive and well and there's lots to...lots to take from it.

12:55 The point is that we have hundreds of thousands of users that are building these various

interesting authoritative source datasets.

13:02 And by bringing them together in this cloud environment, we not only connect our users to our users...

13:07 ...and build applications like we just showed you, but also that information becomes pervasive through the vehicle of the cloud.

13:14 So when we first started 40 some years ago, we were just a research project, and GIS was exactly that.

13:21 Gradually we moved to build software which professionals and enterprises could actually use in various settings.

13:28 What we've done in the last year is jumped in a major way into the cloud so that our users can upload their data...

13:35 ...and share it more effectively.

13:36 And, what I want to close with is this is an interesting opportunity because it means that all of the world's geospatial information...

13:45 ...all of the models, all of the analytics become available for people like yourselves, developers, to build on top of.

13:53 And what I believe philosophically is that, what I believe philosophically is that...

13:58 ...that'll make a huge difference in terms of way the people act and the way they behave.

14:03 It'll be the integration of geospatial science and technology into virtually everything we do.

14:09 Thank you very much.