

# Jack Dangermond on A New Modality for GIS

Esri president Jack Dangermond discusses a new modality for GIS, where advances in technology, measurement, software, science, and open data policies are creating a geospatial infrastructure to support better decision making, communication, and efficiency. This video was recorded for attendees at Geospatial World Forum, India.

<http://video.esri.com/watch/148/jack-dangermond-on-a-new-modality-for-gis>

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## Video Transcription

**00:01** Hi, my name is Jack Dangermond, and I'm going to talk about the dimensions and directions...

**00:09** ...of what I think are happening in the geospatial field.

**00:13** In science, in government, in consumer worlds, et cetera.

**00:18** I think we're entering into what I would call a new modality.

**00:21** And we've seen this and read about these kinds of things in other fields.

**00:26** For example, when film was first invented, the way they did it was film stage plays.

**00:31** And that was interesting because you could film stage play acting and put it in the can...

**00:36** ...and ship it out and take it to many theaters...

**00:38** ...and that acting activity was disseminated everywhere.

**00:43** And then people learned that you could take the camera outside and do live performances...

**00:47** ...and we entered a whole new modality of film.

**00:51** When people began to play around with digital text, the first generation to some extent were still here...

**00:58** ...was make electronic books and put them into these called nooks or other little devices...

**01:03** ...and we can page through them and read books, and it's interesting.

**01:07** But what about Wikipedia and living books and living stories?

**01:11** Or, at the age of a new modality of dissemination of living text and living reading?

**01:18** And we're figuring that out right now.

**01:21** With maps it was the same thing.

**01:22** We went from paper maps to digital maps.

**01:24** And the first efforts were largely based on CAD.

**01:27** We would automate the map, and then we could disseminate the map just like in theater, and stage plays.

**01:34** Lots of people could see the map, but we didn't really leverage the map.

**01:38** We could change the scales, of course, and so on.

**01:41** And then GIS came along and we were able to build a data model of geographic stuff behind the map.

**01:48** That allowed us to create many different maps from the same data and combine the data and do spatial analytics.

**01:55** It became a new modality, and the world changed.

**01:59** We could share this data, we could share the knowledge.

**02:01** And we've really been living in that modality for some decades.

**02:07** We're now entering a new modality for GIS.

**02:10** One that is on the Web.

**02:12** And the first generation was we put maps on the Web in the '90s...

**02:16** ...and then the invention of these slippy maps and Web maps, as they're called...

**02:22** ...with cached information came about and people began to interact with these maps...

**02:26** ...like contribute information back.

**02:28** The age of volunteered geographic information emerged.

**02:31** And then distributed GISs that were served and could be mashed up and integrated.

**02:37** We could do distributed GIS, and the world is changing.

**02:42** And just like with film, we're right in the midst of an enormous change.

**02:48** What is this change going to result in?

**02:50** I think we're seeing it already.

**02:52** On one hand, the development of integrated systems.

**02:58** So instead of just buying a desktop or buying a server or buying a mobile device...

**03:04** ...we're seeing the emergence of GIS systems where all these devices are connected on the Web...

**03:10** ...with a warehouse of geographic information...data and maps and analytic models and workflows.

**03:20** Data models...people are beginning to share this.

**03:24** So we're creating, collectively, an ecosystem of knowledge.

**03:29** So when I buy a desktop, I connect it into the Web and I can get other people's maps, I can get their data.

**03:35** I can download information.

**03:37** I can use their models, their services.

**03:39** And the age of geoservices is emerging.

**03:42** What does this mean?

**03:43** It means that government agencies will continue to use GIS exactly as they have in the past.

**03:49** They will buy technology, they'll automate their maps, they'll make better decisions because of that.

**03:54** They'll integrate science into their work.

**03:57** They'll communicate more effectively and they'll drive efficiency...

**04:01** ...like FedEx does, and all of these interesting private sector companies.

**04:06** But at the same time, many of them are connecting into this ecosystem.

**04:11** They're drawing on cloud information resources, integrated basemaps for the planet, for example, or datasets or Landsat.

**04:19** And they use them in system, in their enterprise systems or their desktop systems.

**04:24** And at the same time, they're sharing much of their content into the infrastructure.

**04:29** This term, the spatial information, or SDI spatial data infrastructure, is actually coming alive...

**04:39** ...finally with the emergence of GIS on the Web.

**04:43** I buy an iPhone, I have GIS on it, and I access this ecosystem.

**04:48** Just like when I buy an iPhone and I access Apple's marvelous ecosystem...

**04:54** ...of music and the Web and all of these things.

**04:58** This is right in the midst of a new modality for GIS where it's multiparticipant...it's distributed.

**05:05** People build on top of their existing workflows and activities...

**05:10** ...geographic knowledge that is sharable and usable.

**05:15** How is this coming about?

**05:16** It's being driven by five main elements.

**05:19** The first is the technology itself.

**05:22** The hardware is getting cheaper, faster...all of the Moore's Law stuff...

**05:28** ...and now being put onto mobile devices and on the Web, and connected.

**05:34** That's one.

**05:35** And that just continues to evolve.

**05:37** A second evolution is measurement itself.

**05:40** We started with digitizing maps 40 years ago, and then remote sensing and more automated techniques...

**05:46** ...for capture, and then sensor networks...

**05:50** ...where we could actually sense online and connect it to the networks...

**05:54** ...and have real-time information coming in.

**05:56** And now, crowd sourcing.

**05:58** Individuals, citizens, can input measurements into GIS on the Web.

**06:04** We can get volunteered geographic information into these systems.

**06:08** And that's making our systems become more real-time and alive and available to everyone...

**06:15** ...through mobile devices and this emergence of the Web and geo on the Web.

**06:21** A third trend that's emerging is the software tools themselves.

**06:24** We've moved from mainframes to minis to workstations to PC software and client/server and enterprise.

**06:32** And now, putting all of these systems in the one system, connected by Web and Web services.

**06:38** This is just very exciting, because it says that we can create, author, data in our desktop; share it on a server...

**06:47** ...access it by anything; share it with our friends; share it with everybody...

**06:52** ...or keep it in a more proprietary environment.

**06:58** This is going very fast.

**06:59** We're adding 3D.

**07:01** Time is now an integral part to space in geography.

**07:05** Being able to visualize better, more real-time kinds of activities.

**07:11** This...this is a march that keeps going on, which is very exciting to me.

**07:17** A fourth dimension is that this technology is affecting what we know, our science.

**07:23** We're able to understand and model processes on the planet.

**07:27** Everything from soil erosion to where it's best to grow particular products.

**07:32** We're able to understand and interpret biology systems, health...

**07:38** ...the science of geography is evolving, now moving into social networks...

**07:43** ...and the integration of social networking technologies and systems with geospatial technologies...

**07:50** ...is giving us new insight into how humans behave.

**07:55** And finally, at the same time, as these other four things are occurring...

**08:00** ...we're seeing the emergence of new, open data sharing policies.

**08:05** This is driven by sometimes political initiatives.

**08:09** In my country, we're seeing it actually from the top.

**08:13** The president of the U.S. himself is driving it.

**08:16** But also, we're seeing in state and local governments.

**08:19** The willingness to share data and get citizens involved, promoting citizens engagement in government...

**08:27** ...is a healthy way to have open democracy...is occurring.

**08:31** It's a fifth dimension to what's occurring in the development of geospatial systems.

**08:38** What does all of this mean?

**08:40** I see in the future the connecting of all systems for collection.

**08:47** Authoritative source datasets and the emergence of a geospatial infrastructure connected through the Web.

**08:56** And open, based on standards, accessible, so that many vendors can participate...

**09:03** ...and many application developers, coders can build apps on top of the infrastructure...

**09:09** ...and push along better behavior in our government.

**09:14** Push along better understanding so our business are more efficient.

**09:18** Push along citizen understanding about the world, what's occurring here.

**09:23** Our environment...push along efficiencies, push along communication...

**09:28** ...because maps are logical instruments for communicating stories of what's going on.

**09:34** This is...this is a big idea.

**09:37** On the other hand, I'm as certain as I'm standing....I'm certain as I'm standing here that this evolution will occur.

**09:45** In terms of the way it'll occur, I see it emerging in two forms.

**09:50** One is a government-business-academic-dominated, distributed environment.

**09:55** Many nodes feeding into one networked system, distributed much like the Web itself.

**10:01** And second, into systems that are clustered around search like we see with Microsoft and Google today.

**10:09** Maps that are a platform that express map services and location services.

**10:15** And they'll be different kinds of information that are emerging on these multiple platforms.

**10:21** In one case, authoritative source information that describes the basic civil society in our science...

**10:28** ...and on the other case, new kinds of information that are collected by following traces...

**10:33** ...of how cell phones move around, building applications about location and location interaction.

**10:41** That'll...that will affect behavior of individuals in their daily lives...everything from search to behavior expressions.

**10:50** In the case of the governments systems and the building of infrastructure, it will affect the way...

**10:55** ...people at the societal level make decisions in government.

**10:59** It will drive the way businesses operate, driving more efficiency and better decisions.

**11:06** So these are two infrastructures, and they will mix and share information.

**11:11** Interoperability standards on the Web itself mean that they can feed each other.

**11:17** We can use the Web to reach consumer information with authoritative source and vice versa.

**11:22** Consumer data and personal behavior data will mix into this kind of emerging infrastructure.

**11:30** So you, in the geospatial field, from the executive down to the technician, are working in a field that's growing very fast.

**11:40** It's emerging and will provide a new kind of knowledge for us to behave and evolve into the future.

**11:49** An infrastructure which will look at all of the footprints of human beings on the planet...

**11:56** ...and guide us in terms of where we put our footprints, how we build...

**12:00** ...how we develop, the decisions that we make...

**12:03** ...areas that we can serve, areas that we protect, areas that we develop.

**12:08** All human behavior and activities will be guided with these geospatial infrastructures...

**12:15** ...which are increasingly socially available to everyone.

**12:19** I challenge you to play harder than this, because I think our future depends upon it.

**12:26** I think it's important.

**12:28** Thank you.