

GIM INTERNATIONAL INTERVIEWS ED PARSONS

Bringing Geography into Everything



As Google's geospatial technologist, Ed Parsons is responsible for evangelising Google's mission to organise the world's information using geography. *GIM International* caught up with this 'man with a mission' in Barcelona during one of his countless foreign trips.

(By Wim van Wegen, *GIM International*)

You're the geospatial technologist at Google, responsible for evangelising Google's mission to organise the world's information using geography. Can you describe that mission?

In many ways it's quite a unique role since the number of people within Google that are really focused on outside the organisation is quite limited. A key aspect of the role is communicating what Google is trying to do in very broad terms to different communities. For me those communities specifically include the academic research community and also potential partners: people that might want to use our technology for applications they are building, or people that might want to contribute content to Google Maps. The broadest community is our users. Here, I've already spoken this week to people from travel magazines and from cookery magazines, all making use of Google technologies.

When you were hired by Google back in 2007 your task was to improve the interface between the new geoweb company and the GIS industry, to bring those two worlds together. How long did it take to succeed?

I'm not sure how far we have succeeded. Maybe the challenge has moved a little bit. I think the traditional GIS world and the mass-market, consumer use of geography have become closer. You see that with the greater use of APIs from companies like Esri. Meanwhile, traditional data providers are opening up and having open data programmes like Kadaster in The Netherlands and Ordnance Survey in the UK. So those have come together a little bit. The challenge that has emerged over the past 10 to 15 years is to try and get the GIS community to adapt more standard web technologies. You could argue that the GIS community has developed a particular way of doing things, almost in parallel to the rest of the internet. We've developed our own web services for producing maps and so on, and for communicating the content of geographical databases. But we've never really made them truly web-compatible. I think that's the next challenge: to make the GIS community more web-savvy. To become citizens of the web, take a less GIS-specific approach to publishing data. We need to recognise that 95% of the consumers of whatever we create will not be GIS specialists. We can't expect them to understand GIS metadata catalogues and particular ways of encoding geographic content that they have never come across before.

You come across as a geospatial technologist preaching to his own community of the like-minded, marching a little way ahead of the troops but never forgetting where he's come from. Is this a fair reflection of you?

Yes, I think so. I'm a geographer at heart and I think geography is a very important science, a very important way of looking at the world. The fundamentals of geography, spatial autocorrelation and intercorrelation, the fact that things close to each other are more related than things further apart, is actually really important in many realms of human activity. So yes, I'm always going to be a geographer. Perhaps what I'm trying to do is bring a bit of geography into everything. I'm less precious than I once was, thinking we need to teach everyone about GIS so that they understand geographic principles. In reality we do need to make small elements of geospatial technology accessible and available to everybody but they don't necessarily need to understand it. Take a company like Uber – it can only exist because of the underlying geospatial technology. But it's not a GIS company, just like social networks are not GIS applications, even though they all have an element with geographic intelligence. That's our future. I often draw the analogy that each organism has DNA and certain sequences are responsible for particular characteristics of that organism. I think there's probably 'geography DNA' in almost every product or service that you use on your mobile phone or on the web nowadays. That's the big difference; it's now possible for that to happen.

Over the past decade, maps have become much more present in everyday life due to internet, mobile devices and social media. The globe is in our pocket now – almost a revolution. Is this a big win for mankind?

[Laughs] Well...maybe a 'big win for mankind' is overselling it a bit. It's certainly transformative. You're absolutely right; mapping is much more accessible and available than it has ever been, largely through the internet and mobile devices. At a very practical level it means

that, as individuals, we probably now take for granted the fact that we're always able to know where we are, anywhere in the world, and we're always able to know – to a reasonable level of accuracy – what's happening around us. Where are the bus stops, where are the restaurants, where's the police station, how do I get from where I am to my hotel? That's crept up on us, that capability. Now we travel with much less planning than we used to. It wasn't that long ago that you'd see people on trains with printouts of maps and their itineraries. Now, we get off the train somewhere and we fire up our smartphone, or smartwatch even, and off we go and find wherever we need to be. Maybe, as result of doing less planning, we're saving a few minutes every day which in we can do other things, and potentially that makes a big difference for us.

On the other side of the equation, if you're a small business looking to attract customers, such as a bicycle shop in The Hague, and you know that there are people in your neighbourhood who are looking for a particular accessory right now for that bike that you have in stock, that can add value as well and help to keep the business moving forward. It works on both sides, for the supplier and for the consumer of that information. Both people benefit from the underlying capabilities that are touching everyone.

Not everyone on the planet is benefiting from the digital revolution that has changed cartography dramatically. How is Google going to solve this?

I don't think that's something that Google alone can solve. Fundamentally we need to get internet access to as many people as possible around the world – not only in countries where the infrastructure isn't yet well established, but also in Europe since there are still many Europeans who don't have access to broadband at home or don't have smartphones. So we need to reduce the costs of the technology as well. At Google we're trying this. For instance, we're looking at developing Android One – a cheaper smartphone. We're looking around the world at different technologies to make internet access both more affordable and more practical. Think of Project Loon, for example (see box). But there's no silver bullet to solve it yet, and it will take developments in terms of hardware and software but also in terms of different business models.

On your blog you wrote that the development of OpenStreetMap as told by its founding father, Steve Coast, is going to be a great read (the book is scheduled for publication mid-2015, Ed.). You called it a truly game-changing event in the mapping industry. Why?

It's hard to deny the impact that OpenStreetMap has had. It's a demonstration that mapping can be carried out by a community of enthusiasts. Given the tools and the internet, you can crowdsource and develop a map of the world which is at least as detailed as those produced by international mapping agencies, and in many ways perhaps more detailed. I remember in my time at Ordnance Survey, that was a big question: would this be possible? If you look at what has happened over the last decade, the answer is obvious. How influential is that going to be on the way that mapping agencies will have geospatial content to create with from now on? We probably don't know yet, but certainly ourselves at Google and Nokia and TomTom have all bought into the concept of our users helping us to keep our maps up to date. Ultimately I think the future role for many mapping agencies will become one of validating and qualifying content that has been created elsewhere. We as individuals change the world around us by our day-to-day activities, so we're the experts in our neighbourhood; we're the people that can tell when the landscape has changed.

In 2014 Google launched a new mapping tool called Cartographer. How does it work?

Cartographer is an experiment. It's a way of potentially solving what we see as one of the big challenges of mapping moving forward: mapping indoors. In the West, we spend the vast majority of our time inside buildings, but most of the geospatial technologies that we've come to rely on – things like GPS and crowdsourced maps, for example – don't work when you go inside. Indoor spaces are usually private, you need permission from whoever owns the buildings to map them. And there's no easy or consistent way of gathering floor plans or architectural designs – BIM is still in its infancy in terms of adoption. Cartographer is an attempt to take some of the lessons we've learned from Streetview and from developing self-driving cars. Can we use that technology to map indoor spaces? Cartographer consists of a backpack with a specialised computer and some laser rangefinders and an inertial measurement unit. It creates a 3D model of an environment as someone simply walks through it. From that 3D model we can create a floor plan available in Google Maps. It's interesting technology and quite quick to develop. It's a different take on solving the problem. It might work, but it might not work – it's an experiment.

Indoor mapping seems to be the new frontier, and indoor mappers are the new explorers. What can we expect in the years ahead?

As with mapping outdoors, we're fundamentally trying to answer the question of 'Where am I?' But indoors, where you no longer have access to reliable GNSS signals, there has to be an alternative to locate where you are. There are many candidates out there – including Wi-Fi, ultra-wideband technology, beacon technology – that might solve that problem. Another challenge is, how do you know what's inside? How do you create maps of the world around you? One method could be BIM and CAD models for 3D mapping. Potentially we could do this photogrammetrically – such as in Project Tango, which is another experiment where we're trying to use photogrammetric techniques to capture 3D data. We always face the challenge of scale. This can be – and already has been – done for the big buildings, e.g. stations, airports, hotels – but how do you scale it to all the buildings you might want to visit? No one has really solved this yet.

At the International Cartographic Conference, the International Map Year will be officially launched – a worldwide celebration of maps and geographic information. What should be celebrated in particular?

The main thing we should celebrate is our success. The fact that maps are now in the hands of hundreds of millions of people and are used by a billion people a month in the case of Google Maps. The fact that maps are impacting on and improving people's everyday lives is a huge change. Maps and geographic information have always had the potential to have that impact, but today we're getting to the point where we can actually deliver on that. Partly because it's no longer just in the hands of the specialists or government agencies – everyone can take part in this now. And obviously that comes with some challenges; after all, you get some pretty poor maps these days because anyone can create a map. But clearly, when technology like this becomes accessible for everyone the world benefits.

A year full of festivities is well-deserved to honour the contribution of maps to our lives, but are there also challenges for the cartography and mapping industry?

Where there are people, there are always challenges. We talked already about indoor mapping, but there are also some residual challenges in mapping the world around us. They are perhaps societal challenges rather than technological ones. The European and North American view of access to information – that information is of benefit to citizens – isn't necessarily shared by everyone. That leads

to difficulties when you're trying to create a global map; something that is OK to map in one part of the world is not OK to map in another. How do you deal with those complexities? I'm not making any sort of value judgement about whether a country is right or wrong in their approach; you just have to be able to deal with that. Perhaps, as a result, you need more educated users who recognise that a map is not reality. Instead it is a reflection of the world for a specific purpose. Every map is designed to communicate a particular message. We need to make sure that people are aware that every map will have had some compromises made in its design.

Do you still like paper maps and printed atlases?

I do still like paper maps! I still have a collection of Ordnance Survey 1:25,000 maps. I occasionally pick up maps if I'm travelling, because they are something of interest. I think I probably always will – as long as they are still produced, I will make use of them. Paper maps are not going to completely disappear, but they will become a more specialised, luxury product that is of more niche interest than it once was. I have memories of picking up an atlas as a child and just looking at it and imagining travelling to the places shown, imagining what the world represented by those maps looked like. Maybe that's something only us geographers experience, maybe that's not generally widespread. Actually I think my true love was computers early on, and it was nice to be able to connect the two. In the very early days it was difficult to represent geography in computers and lots of compromises had to be made. I've always had an interest in the world around me. Most of the people in the industry have that sense of wanting to know why the world is the way it is – its cities, mountains and rivers. That's a fundamental question that we all have and geographers are good at answering it.

Is there anything else you would like to say to the readers of *GIM International*?

Celebrate our success! Our industry is more influential than it has ever been, although that's perhaps less obvious than it once was. We're increasingly a small part of lots of other activities that are happening. It might be that geospatial technology/GI is not at the forefront of these, but nevertheless it's a very important component of them. And that's a good place to be. Google's business model is to make a relatively small amount of money from lots and lots of transactions – it's the scale that brings the benefit. I think there's still potential for the geospatial industry to massively increase its scale in terms of the number of products and services, the number of people that are using geographic and geospatial technology. But to get to that scale we have to simplify what we do. We're making good progress...

Ed Parsons

Ed Parsons is the geospatial technologist of Google, with responsibility for evangelising Google's mission to organise the world's information using geography. In this role he maintains links with universities, research and standards organisations which are involved in the development of geospatial technology.

Parsons was the first chief technology officer in the 200-year-old history of Ordnance Survey, the UK government agency responsible for the official, definitive topographic survey and mapping of Great Britain. He played a vital role in moving the focus of the organisation from mapping to geographical information. He came to the Ordnance Survey from Autodesk, where he was EMEA applications manager for the GIS division.

He earned a Masters degree in applied remote sensing from Cranfield Institute of Technology and holds a honorary doctorate in science from Kingston University, London, UK, and is a fellow of the Royal Geographical Society.

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