

The new Maps Platform

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Thanks, Harold. And hello, everyone, and welcome. I'm Michael Harrell, VP of Engineering for TomTom's new Maps Platform. And I cannot tell you how excited I am to be here today to talk to you. Our new Maps Platform is going to disrupt how mapmaking is done significantly. And I don't use that word lightly. I know, we always hear that word, disruption, and it can feel very overused. But I've been waiting a decade for this moment.

Let me tell you first a little bit about my background, and how I've gotten to this point. I joined TomTom one year ago coming from Amazon. Prior to that, I worked for Microsoft for seven years from 2007 to 2015. We were getting our map from Nokia, HERE now, but the map just wasn't good enough. Just like Google, we decided to make our own map. Gates and Ballmer had seen the eventuality of operating systems becoming fully mobile, and knew having an understanding of where the device was, was going to be critical to the success of their operating systems. Given the quality of maps at the time, we thought we could do it better. We had all this great sensor data. We had the smartest engineers in the world. We knew we could build the best map cheaper and at higher quality. And we did. We created algorithms and solutions that are just now being rediscovered five, ten years later. We were doing it efficiently and really well, but it was costing us hundreds of millions of dollars just for the United States. So, fast-forward a little bit. Satya becomes Chief Executive Officer. We'd collected and completed the United States. We went to go ask for budget for Western Europe and Brazil. Satya saw the price tag. He was like: "Wow." His very next question: "How much am I paying now?" We gave him the answer. Six months later, we were sold to Uber. So why did he do that? Why was that something that Satya sold? Because hundreds of millions of dollars to create a map that's a little better, that's not a clear differentiator for Microsoft. He could take those hundreds of millions of resources and apply it to core differentiation for the business.

So, my team moved over to Uber to start building a map there. I left, I joined Amazon. But I've been watching the mapping industry for the past seven years, seeing the eventuality of all of these different companies trying to build their own map. And then realizing, even though we have all this extra data, even though we have all these machine learning capabilities now, it has only become even more difficult, and really, very expensive. Many different companies have gone in and out of attempting to make a map. Trying to build your own map has proven to be really difficult. And as companies started realizing that they can't build a map themselves, they started looking for alternatives.

This brought about significant growth in open mapping, as you can see here, especially with leading tech companies. OpenStreetMap, or OSM, is the leading open mapping solution. OSM is a community of map builders, manually building and curating the map. It consists of volunteers, GIS students from around the world, mapping their country and local neighborhoods. It also includes paid editors from leading tech companies, like you see here. So, I left Microsoft in 2015, and I'm watching the mapping industry to see how it responds to this challenge. And as we can see, many tech companies have been looking to open mapping as their solution. However, while we see significant growth, many of them that are using open data are only using it for their secondary and tertiary markets. Some are still just evaluating. Why is that? Well, OSM still has challenges that are yet to be overcome.

So, where are we today? What are the different options for the world in mapmaking? We basically have three options. I mentioned my background, building a map yourself. That's super expensive, as I mentioned. And most importantly, it's not a clear differentiator for many companies. You can go with a proprietary map. This is the most common option that's being used today. TomTom, HERE, Google, all

great examples. But these solutions continue to have challenges for companies to use. They don't get to control the prioritization of features and fixes made to the map. TomTom, HERE, Google, they've opened up their map allowing companies to fix issues, but it's still against a proprietary map, and it's still controlled in a way that adds constraints based on the direction in which the proprietary map is going, limiting collaboration, and integration. Even more importantly, the speed at which innovation can occur is limited by the speed of that company, and the resources that company is able to and willing to spend on moving that product forward.

As a result, we see this interest in open data. It's been around for a while and we continue to see companies playing with it. There's a lot of interest. But it's still challenging for many companies, because of things such as slow quality checks. While community activity identifies and fixes issues, these issues can still be exposed to customers before being fixed. Vandalism is a particular concern, as it's an attack vector that didn't exist with proprietary maps. And it's really problematic when it gets exposed. When you compare TomTom's map to OSM, it's clear OSM was built by a community of editors, with their own priorities, not by a company that specializes in geolocation. For example, it's missing significant road coverage, routing capabilities are nowhere close to the proprietary solutions, and it is missing a number of things on top of it to make it a viable product for commercial use. And it also lacks standardization, which is challenging. Each country runs its own community and there's a bunch of differences, even for simple things like month-day. It can be flipped depending on the country, making it really difficult to work with on a global map. And of course, big companies trying to do a lot of work can't do automation, which is problematic when you're trying to leverage all the sensor data you're getting, and the automation and machine learning capabilities you've built.

So, what's TomTom going to do about all this? As I mentioned today, we see these leading tech companies working with OSM, but not fully, due to the challenges I mentioned. Automotive has been evaluating OSM but they've haven't been able to really leverage it, again due to the challenges, but also because they're more cautious with the quality, particularly in coverage and routing. Some have looked at it, but they haven't gone very far with it. This is where TomTom's Maps Platform comes in.

And this is where the disruption is happening. This is big. Now, those using OpenStreetMap can get the full coverage of TomTom's road network. And that provides a significant opportunity for everyone to co-collaborate. It's everything great about TomTom with the added richness of OSM. The TomTom Maps Platform makes OpenStreetMap enterprise-ready, commercial-grade. What I mean by this is that we're going to add in all the extra features and capabilities that have blocked people from using OSM, like standardization of the content. TomTom's Map Platform will read in OSM data and normalize it to a single standard globally. We're working with a few of the top tech companies in the world on this standardization. We've had meetings weekly with them, including several face-to-face sessions. The excitement has been amazing in the working sessions. It's been awesome. I can't tell you how engaged everybody's been. It is challenging how everyone is thinking and strategizing about mapmaking at the top companies in the world that we're working with already.

We're also going to protect from vandalism, bad edits by adding quarantining, keeping those things from making it out into the customers' hands. Then, we're going to add all of our additional content that has made TomTom's maps so great. All the content that you get from our sensor data, and our sophisticated algorithms, our POIs and addresses that we spent significant time sourcing all over the world. All these capabilities within a single ecosystem will bring the resources of the world together to share and work on a better map. Now, instead of being constrained by the resources of a single company, and how fast that single company can go, we're talking about bringing the resources, all the different companies that want to play in the same ecosystem, together. Well, that's going to accelerate mapmaking significantly.

The best analogy, I tell people, we keep saying that self-driving cars are going to be right around the corner. It's going to be a few years out, and then a few years come, and it'll be five years out. And okay, maybe it'll be 10 years out. We keep predicting it, but it never gets here. The reason for this is because of the options I mentioned previously. If you want to get into self driving, you have to build the end-to-end system yourself. You have to spend significant dollars on just redoing what's already been done. Just to add that little extra piece of secret sauce. The ecosystem we can create, it invites everyone in to collaborate. Gain the capabilities from the base, license the content and capabilities you need, and then focus your resources solely on the next innovation that you want and are trying to achieve. It's great for TomTom, because we can focus our innovation toward staying multiple steps ahead with our sensor data and our capabilities. But it also provides a huge opportunity for everyone in the industry to do the same for their area of expertise. TomTom's Maps Platform is the first proprietary mapping solution to embrace open mapping, bringing the best of all these worlds together.

This is how TomTom beats Google and the competition. With the sensor data and unique algorithms for specialized use cases, mapping can no longer be done alone. TomTom's Maps Platform is providing the answer, bringing the collective resources of the world together on a non-differentiating base map, and allowing everybody to focus their efforts where it matters. I know I know, everybody's probably thinking after I said it, how can anyone beat Google? They have what seems to be a bottomless pit of money to spend due to a very successful advertising business. But even Google can't go against the collective resources of the world. And the partners we've talked with thus far are really excited about the platform, it has finally given them the answer they've been looking for. This is why I'm so excited, and I'm not the only one. TomTom has got a ton of excitement happening, particularly for those we've told during the hiring process. We now have over half a dozen directors and VPs that have come from Amazon, over half a dozen directors and VPs that have come from Google, a few of them from Uber, and I'm sure I'm missing a few other tech companies. All in the last two years. Combine this with our TomTom veterans, that have been making maps for decades, and you have an exceptional team of expertise. It's a really unique time here, because it is so exciting, this new platform and ecosystem.

We've seen a big influx from all over the tech community, which has shifted how we do development. We are now moving in to truly being a leading tech company, which is really exciting here at TomTom. Someone asked me, why did I join TomTom? For me personally, I joined because I couldn't imagine reading about this, or watching this happen from the sidelines. I am so happy and feel very lucky that I've been able to be here to tell you about such a big ground-breaking thing that's happening in the mapping industry, and to be a part of that announcement. And with that, I'm going to hand it off to my partner here, Laurens, to tell you a bit more about how our map is getting better, and the great ways we're using and leveraging our sensor data.