Torbjörn Holmström: 'We add automation when it helps our customers' bottom line'

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Volvo has been integrating computer systems in its trucks since the 1970's, when the Swedish carmaker began to hire software engineers. If fully operational autonomous cars represent level 5 of the degree of automation, we're still in level 2 or 3, says Torbjörn Holmström, Senior Advisor to the CEO of Volvo, who until last October was the chief technology officer of the group. "We don't add autonomy or automation if it doesn't make bottom-line sense for our customers." He spoke with LSE Business Review managing editor Helena Vieira on 3 May during a tech conference in New Orleans.

Can you describe what exactly you do in your role at Volvo?

First of all I was the CTO of the Volvo Group for many years. For six months now, I'm the senior advisor to the CEO when it comes to research and technology. So I'm running some projects in which we're trying to investigate, "will this be possible in the future?", and so on, but I don't have the 11 thousand engineers reporting to me as I had half an year ago, and that had been my job for many many years with the Volvo Group. Now I'm a little free and on my own, together with the CEO, and that's why I'm out here, talking. I had never have had the time to attend events like this before.

The Volvo website says you've been working on the company's autonomous truck project since 1979. Has automation been going on for so long?

We started to automate trucks in 1979. We started with transmission automation, engine automation, break automation, and now steering automation. So we have been building the platform for many, many years. In the beginning we didn't think we'd have autonomous vehicles, but where we are standing right now we understand that this is absolutely essential, to have that platform already done, with all the testing we have done. We've already tested functionality in the vehicle which is great for us. So now we can take other steps.

The trajectory for autonomous cars seems to be moving very fast…

I think that the perception is that it moves very, very fast, but in real life, out in society today, if you take the number of cars and trucks that have autonomy, it's completely zero. There's a lot of talk about that. Today we're introducing automation that enhances the driver's performance and makes the driver's job easier. And that's what we did also in 1979. We saw that a driver was worn out when by shifting and clutching, so we simply said, 'we have to do something about that, because the drivers can't really run a vehicle until retirement.' Today we see a lot of new technology coming in but nothing has been released to the public. My view is that we will have things coming into the public within 5 to 10 years. To go fully autonomous in all kinds of operations all over the world, both for trucks and cars, is a very big step. Not just technology wise, but also legally, and the infrastructure, and society, and so on, must be there to make it safe for us going forward.

Can you make a prediction of when we're going to have fully autonomous cars?

If you talk to Silicon Valley they think that they will be ready in 2019. When you say fully autonomous cars, I think in all types of operations we are in the middle of the next decade somewhere.

What are the challenges for an incumbent like Volvo? I would assume you'd have to become more like a software company…

We have Volvo cars, which is one company and we have Volvo commercial vehicles, the group that I represent. In the end, we have been a software company for many, many, many years. Already when I started we began to hire software engineers. It's one thing to be able to hack the code. You have to have the domain and knowledge 'how does the vehicle function?' 'how does mobility function?' and we have a lot of software engineers. The big thing is not to hack the code, it's to understand the domain knowledge and of course to have the capability to use the latest technology. When it comes to software there are elements like artificial intelligence, machine learning, and how to crunch all the data that we're getting now from our vehicles. Today we have some 700 thousand vehicles running that are connected.

Do you think automakers are better positioned in this race than Silicon Valley companies?

I think that what software companies understand is that they're very good at software, but they need to have a platform to put it on. I assume that's why Uber is using Volvo cars. I don't know if Apple and Google will make a car, but it's not so easy to make a car or a truck. Probably what they'll look at is to have someone to cooperate with. But let's see. It takes time to build car factories and to get them up and running.

Are you more advanced in autonomous trucks or in passenger cars?

Volvo cars speak for themselves. We're maybe on the same level, but we're focusing on doing business to business. We don't add autonomy or automation if it doesn't make bottom-line sense for our customers, which I think is a little bit different from a car. It's another type of business. It's business to consumers.

Where do you test the trucks?

All over the world. We have test sites, or engineering sites, in more than ten places in the world. We do a lot of our engineering in Sweden. About 50 to 60 per cent of our engineering is done in Sweden. And of course we do tests in Sweden but we do tests in the US, Brazil, Japan and India, etc.

One concern we read about is road infrastructure. What kinds of changes do you need on the roads?

I think you could run autonomous cars on the infrastructure as it is today, but it would enhance the system if you had smart traffic signs, better visibility, roads that are marked in a better way and things like that. And when we talk about infrastructure of course high definition maps and things like that that need to be there. In the automated-

vehicle end, you need to have a very good connection back to the home base or your server, or your cloud, because I foresee that the amount of computing power and intelligence that you need, you probably need them to be connected also to something outside the vehicle. Because today the computing power that is needed to go fully autonomous is so big that you have to have physically large computers. But of course with the development of the new CPUs or GBUs that are coming, the size is coming down, but that has to go hand in hand with sensor development, software development, and electronic hardware development.

If there's a collision, who's liable?

That's an interesting legal point. First of all, we say that we take responsibility for the vehicle as such. When it leaves, we take full responsibility, but you could also philosophically discuss then, if you have artificial intelligence, if the supplier releases the vehicle out in the public with AI, it will learn as it runs. And of course, what does it mean to learn? So the boundaries, let's call them the 10 commandments of what it could learn, we have to define very well because the software that we produce the vehicle with will not be the same after a while. It learns. AI is software that writes software. That is a tricky thing that we're working on, but as a general definition we take full responsibility for the vehicle.

Will there be drivers in your trucks, or is the goal for trucks to be completely autonomous?

We're talking about different levels of automation. On level 5 you don't have any driver in the truck. But on all other levels, you have a driver inside that in some cases can rest or do something else during driving. The risk is on the higher level, when you take away the driver from the truck.

What level are you at now?

We're at level 2 or 3 in society where you have enhanced systems to help the driver, but we're definitely not at level 5.

And as you said in the beginning, level 5 will be ready next decade?

My view would be next decade, yes. There are others that say it's much earlier, but my view would be, when you say fully autonomous around all types of operations, it will be next decade.

There's a lot of hype about flying cars. Will there be some sort of flying truck too?

Probably not. Flying is for airplanes. Trucks will be on the ground. If you look at the design, something that needs to fly can't carry that type of load. It will be so much energy that you need to get a, let's say 60 ton vehicle flying, I think we'll still have trucks or something that looks like a truck for the coming 40 to 50 years. And based on your experience with trucks, do you think flying cars will be viable?

I think some sort of a drone, a typical helicopter, or something like that, could be something that we'll have in the future. But not mass produced. I think that will take time. Because it takes so much less energy to roll something on a surface, and not lifting it up in the air. So from an energy-consumption point of view, the mobility that we need will probably still be a lot on the ground.

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