India driving global quest for autonomous e-vehicles

Nearly 35% of codes to make one fully driverless car is being written in India

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Quietly but steadily, India is playing a growing role in the global quest for autonomous electric vehicles. Engineers based in India are estimated to be writing roughly 35 per cent of the 100 million lines of codes required to develop one fully driverless car for global vehicle makers.

On the key role being played by India, Karthikeyan Natarajan, engineering R&D council chair of NASSCOM and chief operating officer of Cyient said global auto Tier 1 companies already have over 50,000-55,000 software engineers working in India while OEMs have another 25,000 engineers.

"Service providers to these companies have also hired 40,000 software engineers only for the requirement of automotive software. At least 35 per cent of the 100 million lines of code for making an autonomous car is being done by Indian engineers in the country," said Natarajan.

Of this software work, Natarajan said 50-60 per cent of it is on safety and on the car features at different stages from L2 to L5, namely, from partial driving automation to full automation.

Apart from Cyient, the service providers who are helping in this endeavour include companies such as KPIT Technologies, Tata ELXSI, TCS, Tech Mahindra and HCL Technologies, said Natarajan. An HCL Technologies spokesperson said that it has an advanced autonomous vehicle and connected automobiles technology programme which is working with global clients.

''We do work extensively on AD and ADAS, and also have invested in some solutions that customers have licensed - including one who is running public road trials in Europe with our stack," pointed out Nitin Pai, CMO and chief strategy officer, Tata ELXSI.

According to Regu Ayyaswamy, senior vice-president & global head, Internet of Things (IoT) and Digital Engineering, TCS, the company has invested in technologies and software related to development of autonomous cars. "TCS has been working with new age mobility companies and Auto OEMs in this area. In its automotive center of excellence, TCS has built its own version of autonomous car that incorporates mature advanced driver assist system (ADAS) algorithms, sensor integration and latest semiconductor platforms. These are plying on their campuses in Pune and Chennai as technology demonstrations."

Natarajan said building driverless cars is complex, requiring deep knowledge and technology. Even Tesla, after having 1,000 engineers working on it for 10 years has still not got the final product.

In fact, Natarajan believes it could take over ten years before the world gets a fully autonomous car and on that long road to success, many changes will happen. An electric car, for instance, has between 60-70 electronic controllers for managing the windows, seats, and brakes independently.

In the next stage, engineers are moving towards 'domain controllers' which entails integrating 10-20 independent controllers into one, so that only four or five domain controllers can control functions such as the entire chassis or the braking system.

At the end stage, there will be a central computer or a server architecture as in data centres.

Natarajan also points out that the overall demand for software engineers, across segments, required globally is expected to go up from 11 million currently to 14 million by 2030. At least 1.5-2 million will have to come from India.

"Today, of the 11 million, 850,000 are in India. By 2030 the demand will go up by 3 million, so where do you think the additional numbers will come from? Surely not from China or the US? It will be India," he said.

Natarajan's company provides automotive software solutions to major German auto-makers. A million or so German baby boomers will retire between now and 2028, leading to a labour shortage.

DRIVING THE NEXT GEN

- **Tier-I companies already have 50,000-55,000** software engineers working in India
- **OEMs have another 25,000** engineers
- **Service providers to these companies have also hired** 40,000 software engineers
- **Experts say that demand for software engineers, across segments, required globally** is expected to go up from 11 million currently to 14 million
- **Total number of semiconductor design engineers** globally is 600,000-700,000