

IoT+AI+5G: world's in the midst of a massive revolution

Sujit John & Shilpa Phadnis | TNN

Sambit Sahu, VP of the network and edge group at Intel, has seen many revolutions in his lifetime, including the PC, server, and smartphone ones. Over 30 years, he has even played a key part in them, delivering over 70 groundbreaking technologies worth more than \$100 billion. But, he said, the revolution the world is seeing now with the confluence of IoT, AI and 5G, is by far the biggest of his lifetime. "The next 30 years will see a lot of things come out of it," Sahu said at the Times Techies Friday++ discussion last week on how the edge is transforming every life.

IoT, or edge computing, involves the use of tiny sensors and computing devices at or near the points where data is generated in order to take instant action. One of the best examples is the driverless car, where these devices help to instantly identify obstructions in order to brake quickly. We cannot have the luxury of the data being transported to a cloud for analysis, and the instruction then coming from the cloud to the car. Those extra milliseconds can cause an accident, assuming in the first place that the internet connection to the cloud exists.

Ruchir Dixit, country manager for Siemens EDA, said many of us already have edge devices on us. "My wristwatch is capturing my heart rate, how many calories I have burnt. For the heart rate, the chip sends a light pulse through my skin and collects the reflections of that from the blood vessels, and then measures the difference to see if a pulse happened or not. Another device in my watch, based on a gyrometer, is estimating how many physical movements my hand has done to decide whether it can be counted as a step I have taken," he said.

But there are less visible ones, like in a factory, where, say, dust can impact the efficiency of a robot's ability to pick an object by creating a vacuum. "An edge device on the robot can determine if the vacuum creation capacity is robust and reliable," Dixit said. Or in hazardous locations. Governments and organisations, Dixit said, are putting sensors and edge devices close to volcanoes, and deep in the oceans, to predict when a volcano is likely to erupt (based on thermodynamics of the soil around it), or when a tsunami could happen (based on abnormal water movements).

A volcano, or an oil rig, or indeed, many other locations even in big cities, may not have fibre optic cables to transport

The confluence of IoT, AI and 5G is the foundation of anything you hear of smart homes, smart cities, smart manufacturing, connected healthcare. 5G can accommodate a million devices per sq km.

Sambit Sahu |
VICE PRESIDENT,
INTEL
CORPORATION

India's quality of talent (to build edge-AI technologies) is as good or better than in any other part of the world. But the quantity of talent,

we are really short. That's starting to break at the seams.

Ruchir Dixit |
COUNTRY
MANAGER,
SIEMENS EDA

data. This is where 5G becomes critical to ensure alerts from sensors are received rapidly to initiate necessary action.

Edge computing is also important because it is too expensive to transport everything to the cloud, and puts a heavy burden on bandwidth. The cost to transfer data from the device to the cloud is 20 times more than the cost of transferring from the device to the edge. In a factory, Sahu said, a single camera generates 2,000 terabytes of data per day. But only 1 TB of this is valuable, the rest is a waste. AI at the edge, he said, can filter out the waste, and

send only what's needed to the cloud. "In home automation, any large-scale transfer of data to the cloud would also involve serious privacy concerns," Sahu said.

Siemens and Intel have been closely collaborating on different aspects of these technologies. Siemens EDA (electronic design automation) is a supplier of software and hardware tools that Intel needs to build its chips for AI and IoT. "The chips require advanced software to help design them and we provide those," Dixit said. These chips that Intel develops, in turn, are used in a host of Siemens businesses – in wind turbines, oil & gas equipment, electric trains, factory automation, healthcare analyses.

Sahu said edge requires system talent, software talent, semiconductor talent, applications talent. "India has most of it. Our semiconductor talent is getting better and better, but demand outstrips supply. That's where we need to focus more," he said.

