KRANTI NATION

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How the car industry got computer as its wheels

A car is increasingly becoming like a cell phone. After a consumer buys a phone, the hardware does not change but the software keeps updating and improving.

Passenger cars and other vehicles are now following the same model, especially for electric and hybrid versions. Various software that run different systems of a car need periodic updates for improving performance and sending activity data to the automobile company. Now, computing-heavy electric cars are creating a different paradigm for the automotive sector. A car is now a computer on wheels and it is creating challenges for legacy carmakers.

The fundamental systems, even in non-autonomous cars, include somewhat complex entertainment systems. Navigation systems were independently installed as a separate device about a decade ago but now they come embedded in vehicles. There are sensors and software for external lights that detect corners and turn on automatically. Seats have their own sensors and there is software for simple tasks like reminding occupants to wear security belts and more complex features like regulating heating. BMW has created heated seats as a separate service.

Tesla created software which runs as a single system in its cars, enabling it to update, upgrade and improve features on its own. Legacy car firms are now attempting to follow Tesla

In some countries and models, a user has the option to pay a monthly rental for heating seats. The software effectively allows a company to manage and monitor heating in a car remotely. Other systems that depend on software are power train, safety, and driver assistance.

Until now, each of these systems was run by a different kind of software. Each vendor and component assembly provider used its own software that was finally added to the existing suite of systems in a vehicle.

But this drill is preventing legacy automobile makers from offering rapid updates and improvements. In a recent interview on a podcast, Ford Motors' Chief Executive Officer Jim Farley spoke about the crisis of software for the automobile industry.

Farley said there were more than 150 modules in a car and it was a struggle to make all these systems work well with each other. For any change or update, a company like Ford has to go to the vendor who owns the intellectual property for that particular software.

Tesla, on the other hand, began by creating software which run as a single system in its cars. The company's ability to update, upgrade and improve features is within its own control. Legacy car companies are now attempting to follow the Tesla model for common software. This is especially important for the industry as it transitions to electric vehicles (EV).

There is a strong "paradigm shift in the electric/electronic architecture – away from a domain-specific architecture and toward a vehicle-centralised, zone-oriented architecture," according to automotive technology provider Bosch Mobility. The company believes that "besides resulting in synergies, this approach also offers numerous opportunities to optimise the electronic systems and to get new innovations on to the roads."

"People are willing to pay for an integrated system of telematics, fleet management, energy management, charging for electric commercial vehicles, prognostics and predictive failure," said Ford's Farley at a conference.

The software-based services embedded in a car could offer and create new streams of revenue for auto makers. Like BMW's service of heated seats, other car companies can offer premium features. A shift in the revenue model means that companies will earn from software services and not just from post-sale repairs.

Post-sale repairs and maintenance was a huge revenue earner for internal combustion engine (ICE) vehicles.

In EVs, the need for regular servicing is mostly about battery management. Thus the repairs revenue will shrink significantly for the sector. Shared mobility, common software systems and the rise of EV are creating fundamental shifts for vehicle makers. The automotive sector may soon be better described as the computer-on-wheels industry.