



Tata Technologies has innovated a system to seamlessly update the electronic modules in connected cars, which helps vehicle manufacturers deliver new features safely and speedily.

## THE CONTEXT

The firmware in Engine Control Units (ECU) of new-age, connected vehicles has become increasingly complex. This has led to an increased risk of defects, which leads to customer dissatisfaction, product recalls and safety issues. The need for rigorous software testing often leads to a delay in launching new features or updating the software. Moreover, relying on dealerships for firmware implementation has high cost implications.

Automobile manufacturers who are customers of Tata Technologies (TTL) had been looking for a robust system that could help update ECU modules in new cars seamlessly over the air (i.e., wirelessly) and reduce their time-to-market.

## THE INNOVATION

Tata Technologies' Firmware Over the Air (FOTA) system is designed to seamlessly update electronic modules in connected cars. These wireless updates can be done post sales and thus helps manufacturers to minimise vehicle launch timelines. This also reduces time taken for software development and testing by pushing non-critical updates to post-sales. Moreover it reduces the dependency on dealerships for updates which may lead to defects or product recalls.

Although firmware updates for devices are often wireless-enabled today, there are several additional challenges in the case of vehicles, such as data transmission cost, vehicle functionality during the time of update, memory storage required to store a pending update, update failure recovery protocol, and safety of the vehicle while updating. Tata technologies' innovation streamlines the update process. Its seamless and robust firmware update architecture resolves the issues and is an industry-first solution. Moreover, the design allows the option of waiting for a known Wi-Fi connection when the update is deemed minor, making the update process more safe.

## KEY CHALLENGE

### SECURITY

This was difficult to achieve because sending updates when the vehicle was mobile meant verified Wi-Fi signals were not always available and there was the risk of hacking attacks.



### THE IMPACT

Revenue generated  
**\$2.2 MN**

Reduced  
time-to-market by  
around 3.5 hours per  
car thereby launching  
vehicle faster to the  
market