SBD Explores: Over-the-Air updates
Laying the foundations for an efficient Over-the-Air update strategy

10-minute Insight

Over-the-Air updates (referred to as OTAs) are a way of installing new software on a vehicle remotely. OTA updates can be used to both resolve faults and improve the user experience of vehicle software.

In early 2018 in the USA, 33 models across 5 brands had OTA capabilities. In late 2023, around 309 models across 23 brands had OTA capabilities. This is an increase from 10% of models having OTA capabilities, to 90% in less than 5 years.

The growth in the use of OTAs has been tracked by SBD Automotive and, recently, new OTA update data has become available and published in SBD Report 638. The new data shows how OEMs are using individual OTAs. It also shows how frequently OTAs are issued and the most common types of OTAs.

In this edition of SBD Explores, we explore how OEM OTA activity can help determine the organizational fitness of an OEM and which domains within vehicle models are connected.

Target audience   **Focus market(s)**

Product planning   Strategy   Global

Engineering   Investing

What is happening?

Number Of Recalls That Only Required Software Updates (hardware changes not made)

Source: RDW(Netherlands), NHTSA (USA)
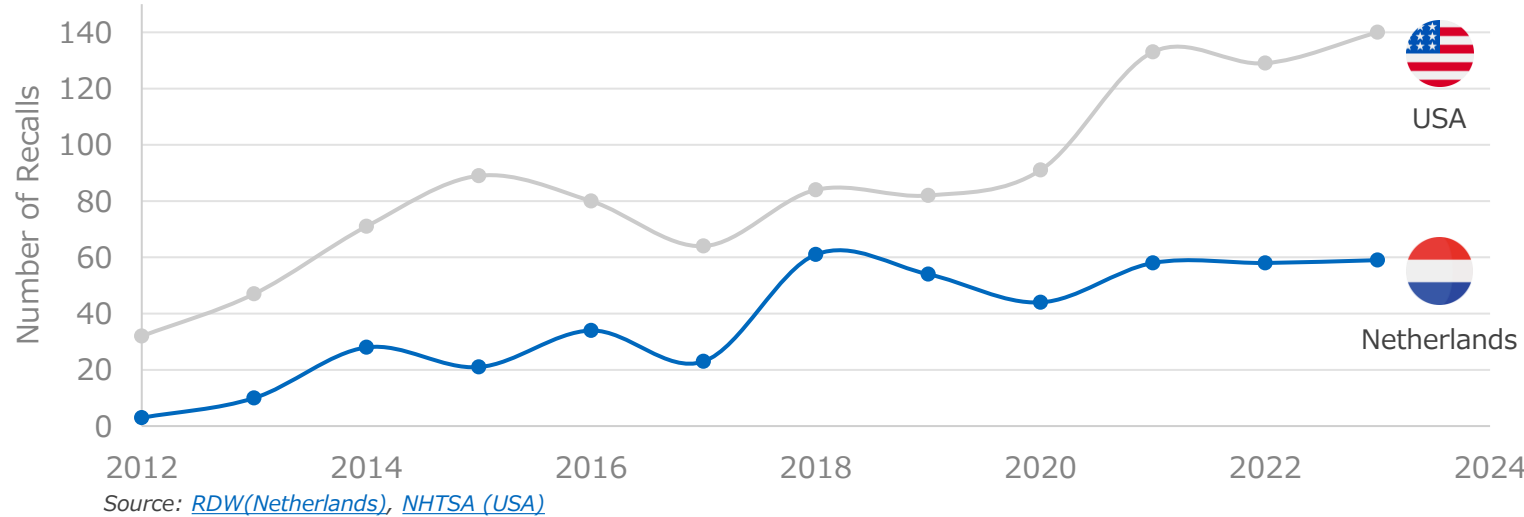
OTA updates issued per quarter (not necessarily for the purposes of a recall)

Source: SBD Automotive - OTA & SW-Delivered Features Guide (638)
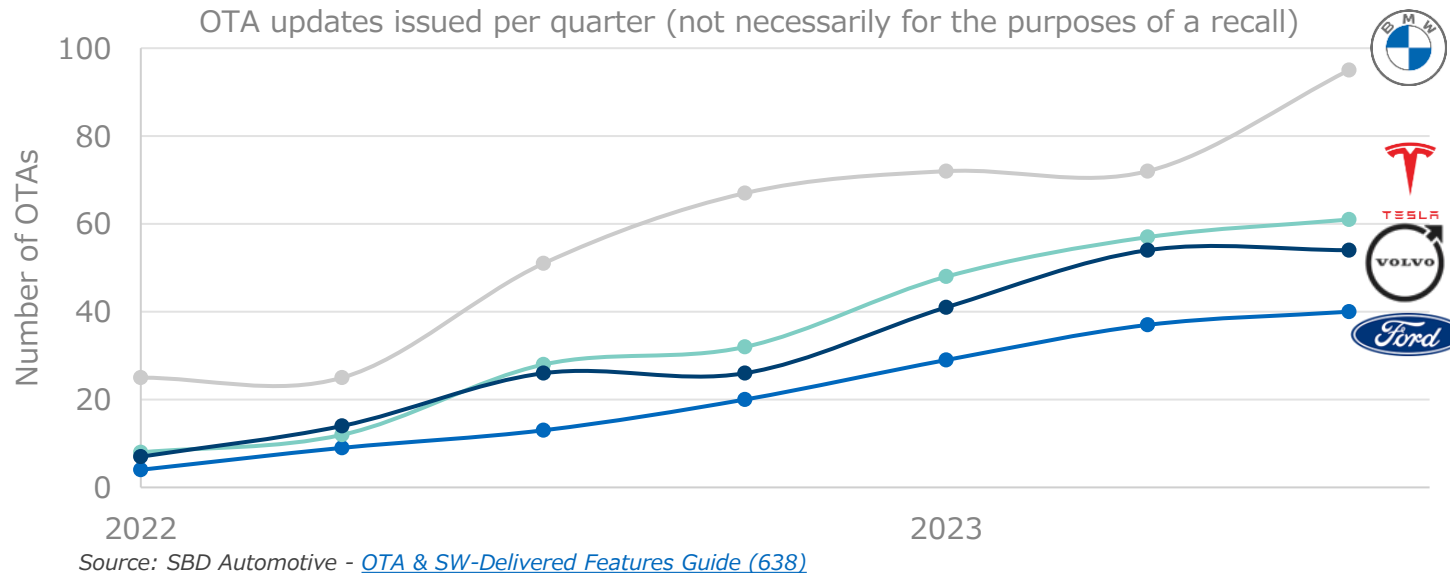
Key takeaway

As vehicles become increasingly software-defined, the risk of software problems occurring increases. Software problems can create a negative user experience and can impact safety. These consequences create a need for software updates to be carried out quickly.
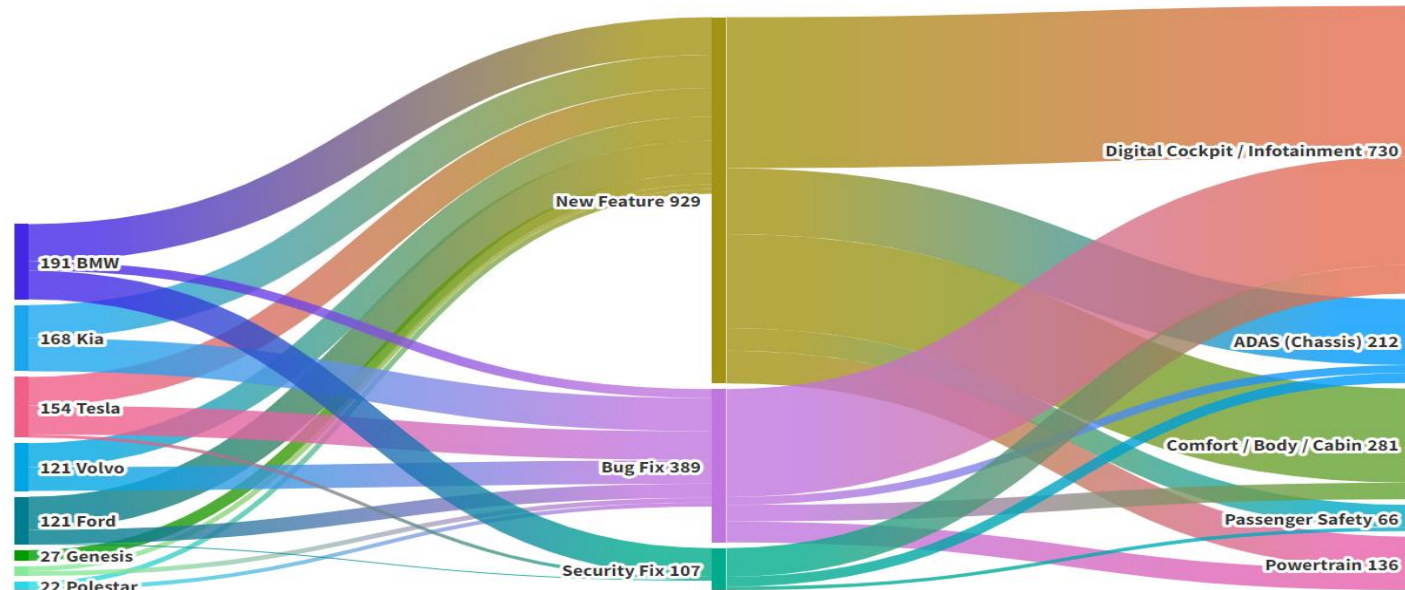
- Originally, OTA updates were developed to allow OEMs to address software problems directly without the need for a vehicle to be returned to a dealership. Dealership visits can be expensive for an OEM. OTA updates are more convenient and have the potential to cut costs.

- Since 2012, as shown in the graph on this page, the number of recalls initiated by authorities related only to software has increased. Though recalls are a formal process and OTAs aren't used exclusively for this purpose, the data and overall trend could give an indication of the rising need for OTA capabilities.

- SBD Automotive report 638 provides insights into the factors influencing OTA updates and an indicator of OEMs' readiness in adapting to the wider use of OTA updates and implementation of Features as a Service.
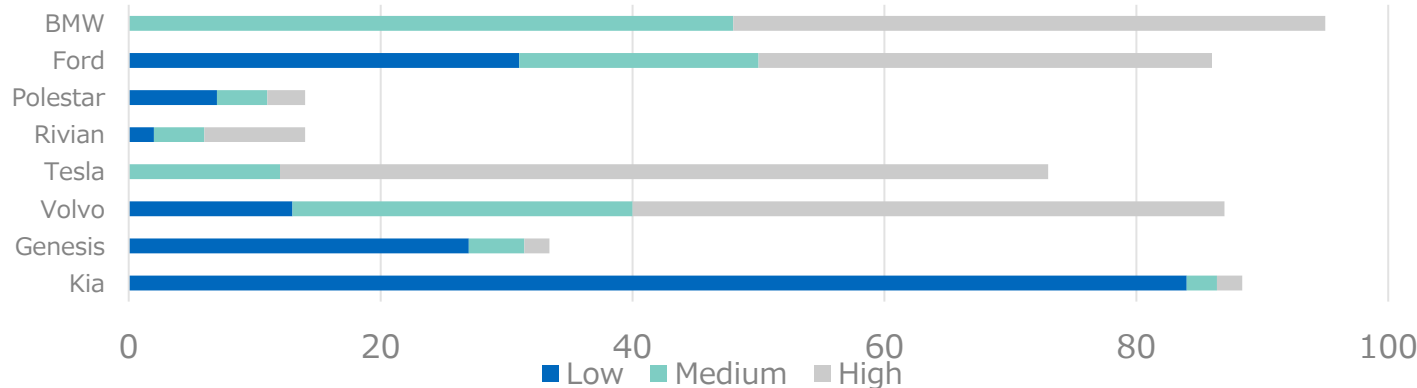
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Why does it matter?

OTA Update Type & Domain for the Top 7 OEMs by OTA volume
Update volume, we tracked the purpose of OTA updates

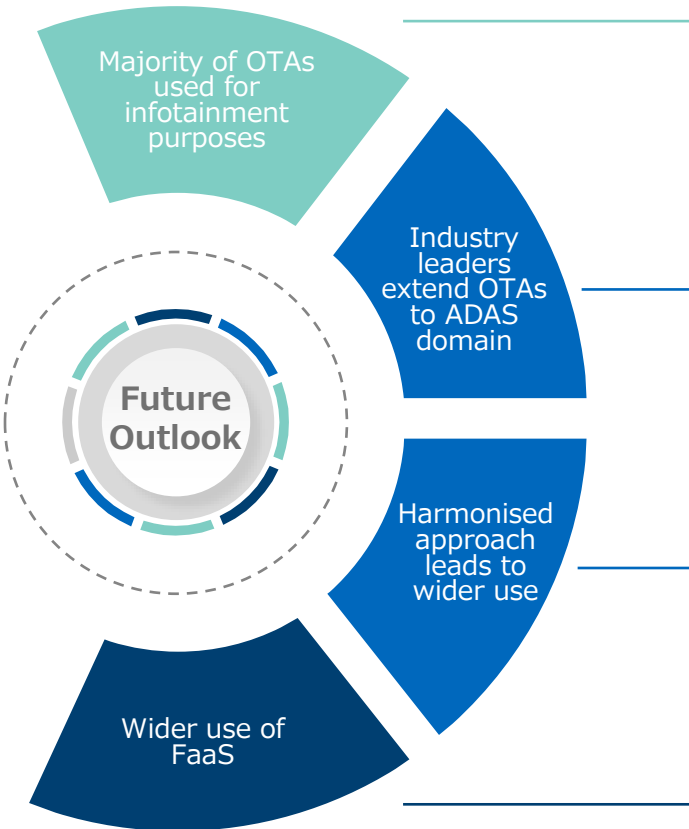*Source: SBD Automotive - OTA & SW-Delivered Features Guide (638)*

OTA Update Significance (2023)

Low · Medium · High

Key takeaway

OTAs were originally developed to reduce the cost of solving issues discovered with a vehicle. A vehicle with multiple connected domains allows problems in different areas of the vehicle to be resolved by OTA.

- In 2023 in the USA, the digital cockpit and infotainment domain received the most OTAs from OEMs. The infotainment domain is not a safety related feature so less testing is required. Vehicle modems, that can receive updates, are also more likely to be connected to the infotainment system.

- The use of OTAs for powertrain, and passenger safety may be influenced by regulation because of the potential to alter a vehicle beyond its original design. In this case, some authorities are considering if an OEM should be allowed to update vehicle software that isn't owned by the OEM.

- An organization must have the 'fitness' to develop OTAs quickly. This requires a robust verification procedure to ensure an OTA doesn't influence multiple domains by accident. OEMs must mitigate unintended consequences to other domains.

- **Update Significance:** *High:* Updates are related to ADAS and Passenger Safety domains. *Medium:* Update to Powertrain, cyber security, comfort. *Low:* Bug Fixes and infotainment or any minor updates.

Where Next?

Majority of OTAs used for infotainment purposes

Industry leaders extend OTAs to ADAS domain

Future Outlook

Harmonised approach leads to wider use

Wider use of FaaS

1 OTAs in the automotive industry were introduced as a way to implement software fixes without bringing the vehicle to a dealership. Leading OEMs have advanced to a level where OEMs use OTAs for new infotainment and ADAS features.

2 It is likely that OTA update capabilities will continue to be extended to other vehicle domains – ADAS is most likely. The functionality of ADAS can be expanded with an OTA update. For example, the maximum speed defined for an ADAS feature could be raised with an OTA update.

3 Confirming a global harmonized approach to how OTAs can be used will give OEMs certainty on how OTAs that affect regulated systems should be processed. This will give the freedom to carry out OTAs more readily and will unlock the wider use of OTAs.

4 While some OEMs have already integrated FaaS in certain domains, it has yet to become mainstream in most regions. SBD anticipates a shift in OEM capabilities, foreseeing the extension of updates to other domains over-the-air and to FaaS.

Now | **1-10yrs** | **10yrs+**

Key takeaway

Past frequency of OTA updates by an OEM, and the number of updateable domains, are indicators of an OEMs organizational and domain connectivity strategy. These can be used as benchmarks to determine the market position of the OEM.

- Looking at OEMs past and present OTA strategy is not only helpful for benchmarking, but it also helps determine their future ability to handle fixes.

- OEMs will progress their OTA capabilities at different rates due to legacy organizational structures, manufacturing approaches, and product strategies.

- As well as increasing the number of domains that can be updated over the air, OEMs should also focus on developing a robust deployment process with effective verification and validation.

- The progression goals for OTA updates must be established at an organizational level. In the long term, decisions about which domains will become updateable need consideration, as not every domain on every vehicle is currently updateable. This variability necessitates an adaptive pricing strategy.

- A deep dive into latest OTAs and OEM strategy is available in SBD OTA Guide. OEMs offering Features as a Service, and their pricing strategy, are also shown.

Who to watch out for?

Region	OTA with FaaS deployed
	OTA with FaaS deployed OEM has rolled out FaaS on some vehicles and consumers are able to upgrade to new features
🇨🇳 (China)	TANK, WEY, 理想, XPENG, ZEEKR, TESLA, NIO
🇪🇺 (EU)	Audi, Mercedes-Benz, SKODA, BMW
🇺🇸 (USA)	Audi, CHEVROLET, Mercedes-Benz, BMW, Cadillac, PORSCHE, ACURA, TESLA, Ford

Latest announcements

New Honda Prologue will support OTA

Honda's new electric SUV will be updated via OTA. The vehicle has Google built-in meaning apps can be downloaded and updated.

Ford expands BlueCruise business model

Ford has expanded BlueCruise to include a free trail. They will also offer monthly and annual offers for hands-free driving software.

Audi Themes

Audi has partnered with Valtech Mobility to offer a range of themes for purchase from the Audi store.

Key takeaway

Some Features-as-a-Service are downloaded to the vehicle when purchased. OEMs may wish to monitor early adopters of Features-as-a-Service (FaaS) and the pricing strategy they use.

- **Standard bodies and type approval authorities**: They may slow down the process of sending OTAs. First, it must be determined if the OTA impacts Type approval, requiring evidence. If yes, then it may need to be tested. This takes time and may prevent an OTA from being released.

- **Chinese OEMs** are consistently in the position where they can release OTAs and have integrated FaaS into their business model. More information about the progression of Chinese OEMs in the context of OTA is available in SBD Report 638.

- **OEMs** have begun to adjust their internal organizations and development processes to deliver OTAs and begin to offer FaaS. SBD anticipates that the market will see increasing number of models with OTA capabilities across the entire vehicle.
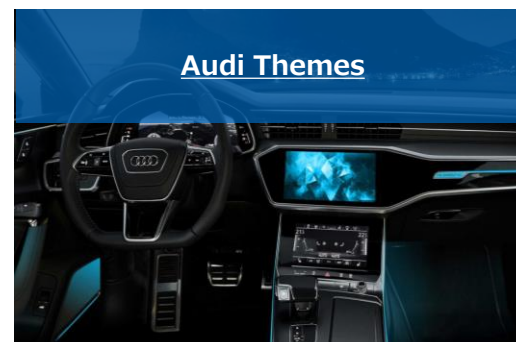
How should you react?

1 **Evaluate**
Evaluate the challenges and opportunities that emerge from the introduction of OTA updates and services.

2 **Optimize**
The organizational structure to ensure it is capable of delivering OTA updates frequently.

3 **Improve**
Cybersecurity measures have to be modified and adopted to accommodate OTA updates and services.

Authors

Kurian Valiyaveettil Kurian
Research Analyst

Michael Levet
Senior Analytical Reports Specialist

Related SBD Reports

638 – OTA, FaaS & SW-Delivered Features Guide

536 – Connected Car Forecast

Related SBD Consultancy

- Competitive Assessment
- Market Landscape
- Due Diligence
- Strategic Advisory

Interested in finding out more?

Most of our work is helping clients go deeper into new challenges and opportunities through custom projects. If you would like to discuss recent projects that we've completed relating to OTA updates and Features-as-a-Service, please contact us.