



Cloud or Edge? The Best Driver Experiences Require a Hybrid Approach

June 28, 2021

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At Apple's Worldwide Developer Conference (WWDC) earlier this month, one of the major [pieces of news](#) was the introduction of on-device speech recognition, meaning Apple device users can now access Siri without an internet connection. This news, while not entirely surprising given Apple's approach to having AI "in your hand and not the cloud," is worth noting as it relates to the broader discussion around how computing is done today. While the cloud has allowed us to expand in many ways when it comes to real-time updates, new content and services, and scaling compute power up and down as necessary, it can have drawbacks. That's why embedded machine learning, like Apple's "on-device" approach, is coming back into focus and edge computing is on the rise.

At Cerence, we believe both embedded systems and cloud connectivity have their places. Our philosophy, especially in the world of automotive and mobility, is to deploy a hybrid model, taking advantage of the benefits of both cloud and embedded technologies. For OEMs, this "best of both worlds" approach to design and development is fundamental to providing the best possible experience for drivers – getting them the information they need in a fast, secure, and appropriate way without incurring unnecessary cost.

Enhancing the driver experience

A major advantage to cloud computing is the ability for systems to be updated on continuous basis, which helps OEMs keep software current and cutting edge, and enables them to continuously roll out new features. There are some situations in the car where cloud is simply a must-have. Take, for example, a driver who wants to get a Yelp review for a restaurant he or she is driving by, or check the score of the soccer match. This information will not exist within an embedded in-car system, but the ability to quickly provide it to drivers is critical for OEMs who want to ensure a great experience that matches the smartphone-level intelligence today's consumer demands.

That said, a cloud-only system can have its pitfalls. While drivers may expect a Zoom call to drop in a dead zone near their homes, they don't anticipate losing access to their voice-powered car controls. "In-car" capabilities should work regardless of the phone network status. Therefore, it's critical for OEMs to consider where an embedded approach might make more sense for enabling the driver experience. Embedded technologies are more secure, in some cases faster, and more reliable in areas of low connectivity than their cloud counterparts. Users expect to be able to connect to their virtual assistant wherever they are. Furthermore, embedding voice systems into the car with tight integration to non-speech modalities (e.g., haptic input, gaze and gesture) can ensure a consistent user experience and maximized access to onboard data and sensors for safety and enhanced drivability.

Future proofing with a hybrid approach

Ultimately, OEMs need both cloud and embedded technologies to win in today's market – and to prepare for what's next. As we see edge computing on the rise and autonomous vehicles continuing to advance, having AI "onboard" is a concept that is only becoming more critical, but with all the benefits of cloud-based services and content integrated to enhance the experience. OEMs can take advantage of applications that work best when embedded, while using cloud connectivity when it best serves the driver experience – a flexible, hybrid approach that provides amazing benefits to drivers.

While Apple's news is not surprising, it's an important indication of the path forward for device makers and mobility OEMs alike as they look to create fast, intelligent experiences that build loyalty with consumers.

For more on our Cerence Drive platform and hybrid approach to mobility assistants, visit www.cerence.com/cerence-products/core-technologies.