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The Next Big OS War Is in Your Dashboard

By [Doug Newcomb](#)

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Photo: Jim Merithew/Wired

Competition in automotive technology has long been about who's got the most horsepower, the best towing capacity or the fastest acceleration. These days, though, it's all about having the slickest infotainment systems and most-connected cars.

The shift in focus from what's under the hood to what's behind the dashboard has brought a largely covert war to the auto industry over the operating systems that will control these gadgets. As in the smartphone biz, the battle line is [between proprietary and open source software](#). The outcome will determine what these systems look like, how they work and how distinctive they are as automakers embrace walled gardens or open ecosystems.

It would be difficult to overstate the importance of getting this right. The amount of software in the average vehicle has grown exponentially — a typical new car has about 100 million lines of code — with the advent of sophisticated, cloud-connected infotainment systems. Software has become a competitive advantage as vital to General Motors or Toyota as it is to Apple or Google. The trouble is, automotive development cycles are measured in years, while the consumer

electronics industry works in months. The race is on to ramp up development, which is why we're seeing companies like [Cisco get into the automotive game](#) and electronics execs like Apple's Eddy Cue [taking a seat on Ferrari's board](#).

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“The theme I hear time and time again from every single one of our customers is you’ve got to help us move at the pace of consumer electronics,” Derek Kuhn, vice president of sales and marketing for [QNX Software Systems](#), told Wired. “It’s no longer acceptable to innovate at the pace of automotive.”

Proprietary software still rules, with QNX and Microsoft dominating the field. Windows Embedded is best known as the platform behind Ford’s successful Sync system, and it underpins similar systems by Kia, Fiat and 15 other automakers. QNX develops infotainment software for Audi, BMW, Ford, GM, Honda, Mercedes, and Toyota and is used in millions of vehicles.

But with Linux getting into the game with the [Automotive Grade Linux Work Group](#) — which includes Nissan and Toyota as well as “tier-one” suppliers such as Harman, Intel, and Nvidia — open source will grow more popular. Since forming in 2009, the nonprofit [Genivi](#) that includes BMW, GM, Honda, Hyundai and Nissan as well as Harman, Bosch, Continental and other suppliers has pushed for “the broad adoption of an in-vehicle infotainment open source development platform.” In addition, automakers like Ford and BMW are launching open source initiatives like [OpenXC](#) and [webinos](#), respectively.

Automakers like the open source approach because it gives them broader control of their software platforms and the ability to tailor the features and experience to suit their customers.

They can develop the product they want, not the one they're given. This allows for much greater differentiation among automakers and suppliers.

"If a carmaker or a tier-one goes to a supplier like Microsoft, they get a very mature product, but they're dependent on the tools that come from that one supplier," said Joel Hoffman, a Genivi board member and strategic market development manager of Intel's In-Vehicle Infotainment Group. "Open source is attractive because if you're a developer in the tier-one or OEM community, you can actually write features into that shared community. You can't do that with QNX or with Microsoft. They have parts you could contribute, but you have one source, and that one source controls your destiny."

The downside to the open source approach is big players like Microsoft have forgotten more than automakers like Ford have ever known about software. Automakers tend to be risk adverse in the extreme and want bulletproof systems that work reliably for the life of the vehicle. That gives Microsoft, with its unparalleled depth of knowledge, an advantage over automakers working in-house.

"[Windows Embedded] is built on a robust real-time software platform that ships in tens of millions of devices each year," said Walter Sullivan, senior program manager for Windows Embedded. "We're able to take [our experience] from that broad set of devices and make the core more stable. The longevity of the platform and the long-term focus and approach that we take helps us to provide software that few others can."

Advocates of propriety systems argue they are easier to update, even if updates to automotive infotainment systems have, so far, been few and far between. That will change as consumers come to expect vehicle electronics to deliver up-to-the-minute features and as more mobile carriers enter car connectivity.

Verizon recently purchased Mercedes-Benz supplier Hughes Telematics, and Sprint is set to launch its [Velocity](#) "end-to-end" connectivity solution for automakers, which has already debuted on the Dodge Ram and Viper under the name [Uconnect Access](#). Sprint is shopping the system — which combines "telematics" services such as 911 emergency assistance and vehicle diagnostics with in-vehicle Wi-Fi and in-dash apps — to other car companies.

Photo: Alex Washburn / Wired

Sullivan points to Sync, the first automotive infotainment systems to allow for software upgrades, as evidence that a proprietary approach allows for future flexibility. “We design our platform to be upgradeable from the very beginning,” he said. “And being the sole author of all of the core components of that platform, we can ensure that the ability to upgrade is baked into each software component.

That will change, though, as wireless updates become more common. Tesla Motors was the first company to [update a vehicle’s software wirelessly](#), and open source advocates say the inherent flexibility of such systems will make updates a snap. And, they say, updating a proprietary system becomes moot if and when the company behind it abandons it.

“If Microsoft decides that Windows Embedded is no longer a lucrative business and calls for an end for this particular system, then the car companies are stuck,” said Rudolf Streif, director of Embedded Solutions at The Linux Foundation. “With open source, you have thousands and thousands providers and you get the source code so you would be able to maintain it yourself if you had to.”

At this point, Microsoft and QNX is winning the battle, but not the war. Open source software has appeared in just one high-profile application so far: the [Linux-powered CUE](#) infotainment system in the 2013 Cadillac XTS. But Strief has no doubt we’ll see more because open-source allows automakers to tailor their systems.

“Differentiating functionality of the user interfaces, that’s the trend, and it’s mainly through open source software,” he said. “I know many are working on it.” Hoffman is even more bullish, claiming, “at least 90 percent of the car companies and suppliers that have an interest in Linux. The interest in automotive has grown substantially.”

Even as the automotive OS war heats up, there is some indication it may end in détente.

Microsoft plays nicely with open source communities — particularly in the enterprise space — and there’s no reason to believe we won’t see similar things happen in the automotive sector.

Such a compromise would allow automakers to use whatever they need to offer the best product at the lowest cost.

“I see what I call controlled openness as a guiding principle,” said Thilo Koslowki, an automotive analyst at Gartner. “Not only do you bring these connected features to consumers faster this way, but also save money. The cost-saving aspect is extremely important because automakers will never have the sales volume of smartphone makers. So they have to try to leverage this controlled openness. But at the end of the day it can’t be completely open because you lose differentiation.”

HTML5, which is making its way to automotive infotainment, could foster détente because it allows automakers to design systems that are easy to update across platforms while bringing smartphone-like apps to the dashboard. QNX, for example, is betting big on HTML5, which has seen something of a setback in the mobile arena but could catch on in cars.

“There’s still some maturing that needs to be done, especially for automotive application,” said Jim Buczkowski, a Henry Ford Technical Fellow. “But I definitely think HTML5 will have big impact.”

Although the outcome of this fight will directly shape the consumer experience, most people probably won’t care whether their infotainment system is driven by Microsoft or Linux or some operating system yet to come. The automotive industry almost certainly wants to see at least two or three prevailing systems because Ford and General Motors, Toyota and Honda or BMW and Mercedes-Benz will always want to differentiate themselves.

But consumers won’t care. They’ll just want an experience that’s easy, intuitive and elegant.

“It’s not really about whether it’s connected to Microsoft or Linux,” Hoffman said. “It’s who does the best job of implementing it, as we’ve seen in the phone business.”

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