In for the long term: what HTML5 means to the auto industry

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Consumers today can use their smartphones, tablets, and televisions to access their personal content at any time, and they expect their cars to support this connected lifestyle. Automakers recognize this trend and see it as an opportunity to engage consumers and enhance the desirability of their vehicles. As a result, car infotainment systems are evolving from purpose-specific devices into connected, upgradeable platforms that can integrate seamlessly with smartphones and, increasingly, the cloud. Automakers also aim to add value by providing consumers with a personalized driving experience that keeps the car fresh with smartphone innovations — bringing apps into the car offers a way to do just that. In fact, a 2013 report from Juniper Research states that, by 2017, 20% of consumer cars in Western Europe and North America will be capable of supporting apps.

Apps for cars come in two forms, built-in or brought-in, and both types can co-exist in an infotainment system. Built-in apps run on the head unit and can directly access vehicle data and services such as GPS and sensor information. Brought-in apps run on a smartphone, tablet, or other nomadic device and connect to the head unit. Connectivity solutions such as MirrorLink allow the user to interact with brought-in apps through steering-wheel buttons, the head-unit touchscreen, or other in-car controls.

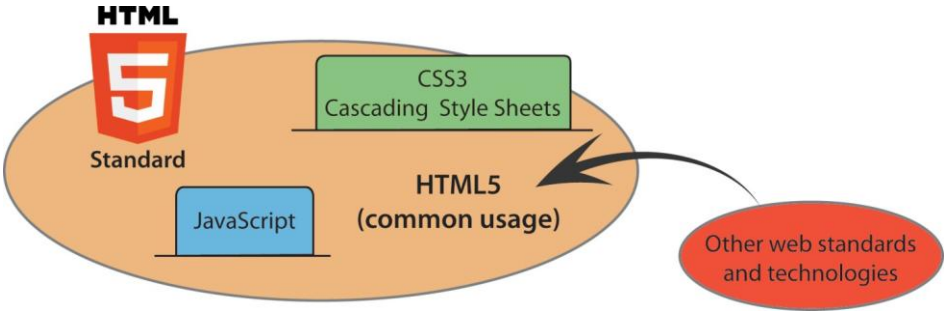
Bringing apps into the car has many benefits, but also several challenges. For instance, apps must be designed or adapted with safety in mind; they cannot distract the driver. Also, development times for in-vehicle systems are much longer than those for smartphones and smartphone apps. New phones come out every month — and new apps come out every hour — whereas new infotainment systems can take three years to go from drawing board to production. How can a car infotainment system designed today work with phones or apps created tomorrow, or several years from now?

Fragmentation is also an issue. Infotainment systems are based on a variety of processors, operating system (OS) platforms, screen sizes, and application programming interfaces (APIs). This fragmentation, together with long automotive development cycles, makes it difficult for automotive companies to attract the interest of mobile developers. Many of the most compelling apps are created by smaller, independent developers, yet these developers are the least likely to work with automotive companies for the simple reason that they don’t have the financial resources to make the necessary long-term investment.

All these issues point to the need for a long-term, industry-standard solution. And increasingly, that solution is HTML5.

Eliminating lock-in

Strictly speaking, HTML5 is the next standard for web page rendering. But in more common usage, HTML5 consists of a set of non-proprietary technologies for delivering content and functionality to all manner of devices, including in-vehicle systems. These technologies include HTML5 itself, CSS3 (Cascading Style Sheets), the JavaScript scripting language and its associated standards (e.g. AJAX, JSON), and other non-proprietary standards, including XML.



HTML5 and some of the non-proprietary technologies it draws upon.

No one “owns” HTML5, so automotive companies don’t have to worry about vendor lock-in. Moreover, HTML5 has been widely adopted for web and app development on a variety of mobile operating systems, including Android, BlackBerry, iOS, and Windows Phone. For these and other reasons, HTML5 has become the most widely supported platform for mobile app development, giving automotive companies access to a vast pool of developers and applications. HTML5 also offers the advantage of being a long-term solution: editors of the standard have made sure that HTML5 is ready to embrace new technologies as they become available.

Controlling the UX

With HTML5, it is relatively easy to keep an infotainment system fresh with new content. If the system supports HTML5, it can support almost any HTML5 app or service. The system doesn’t even need a browser, only an HTML5 engine. As a result, a car infotainment system can support new apps created long after the system was built. Just as important, automotive companies can minimize distraction by using CSS3 to control what app features are available to the driver. With CSS, automakers can simplify displays, refine controls, and impose their own branding, all without changing underlying functionality or technology.

Enabling platform choice

As a further benefit, HTML5 is OS neutral; it doesn’t force the automaker into using a specific proprietary or open source OS. Applications and HMI (human machine interface) components built with HTML5 can run on multiple OS platforms, enabling automotive companies to choose or implement platforms that offer the fastest boot speed, greatest reliability, or highest performance on multicore processors — things that ultimately enable a better user experience and greater consumer satisfaction.

Working in concert with native HMI toolkits

HTML5 enables the car to become a cross-platform application environment. It can even serve as the basis for the car's HMI, though native toolkits such as Qt, Elektrobit EB GUIDE, and Crank Storyboard often provide a better alternative for creating fast, efficient HMIs. Fortunately, HTML5 can work in concert with other HMI toolkits and technologies. For instance, in the QNX CAR™ Platform for Infotainment, developers can build an HMI with a native toolkit and blend it with HTML5 content and apps — native and HTML5 components can appear on the same display and at the same time. Among other things, this flexibility enables a more responsive end-user experience by allowing system designers to choose the most appropriate technology, or combination of technologies, for each system or application.

A head unit in which apps from a mix of mobile environments, including HTML5, run in an HMI built with a native toolkit.

Standardizing access to vehicle data

HTML5 supports any combination of content and service delivery, including web, built-in apps, brought-in apps, and cloud-based services. This flexibility makes HTML ideal both for keeping infotainment systems current with new content and for integrating them with smartphones and other devices. Given these and other benefits, it is encouraging to see that the Worldwide Web Consortium (W3C) has launched the Automotive and Web Platform Business group. The group brings together developers, automakers, and automotive technology vendors with the mandate to accelerate the adoption of web technologies, including HTML5, CSS3, and JavaScript, in automotive systems. Currently, the group is drafting a standard set of JavaScript APIs for accessing vehicle sensor information.

In addition, automakers will be able to leverage mobile app development through Apache Cordova, which offers a set of standardized JavaScript APIs

for accessing native device functionality. Because Cordova APIs are consistent across multiple platforms, including Android, BlackBerry, iOS, and Windows Phone, an app built with web-only technologies (HTML5, CSS, JavaScript) can easily target any supported platform with few to no changes. QNX Software Systems is developing Cordova-compliant JavaScript APIs for its QNX CAR Platform for Infotainment; these APIs will help app developers target their apps to yet another device — the car.

About QNX Software Systems

QNX Software Systems Limited, a subsidiary of BlackBerry, is a leading vendor of operating systems, development tools, and professional services for connected embedded systems. Global leaders such as Audi, Cisco, General Electric, Lockheed Martin, and Siemens depend on QNX technology for vehicle infotainment units, network routers, medical devices, industrial automation systems, security and defense systems, and other mission- or life-critical applications. Founded in 1980, QNX Software Systems Limited is headquartered in Ottawa, Canada; its products are distributed in more than 100 countries worldwide. Visit www.qnx.com and facebook.com/QNXSoftwareSystems, and follow @QNX_News on Twitter. For more information on the company's automotive work, visit qnxauto.blogspot.com and follow @QNX_Auto.

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