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Gadget Car

Marcin Handlik, Shinjiro Urata
ACCESS

Car manufacturers and their suppliers have nowadays a difficult decision to take: how to shape the software stacks and the related hardware for their new in-car designs that could satisfy the complete lifecycle of the car.

Cars are not disposed of as mobile terminals. They live longer, still being objects of desire despite their age and technical condition. The Web develops so fast that we experience multiple disruptive innovations of the Web within the life cycle of a single car model. In-vehicle infotainment (IVI) systems – the actual Web enablers in the car - are, however, subject to the similar working environments as the other Web-enablers: mobiles or set-top-boxes, i.e. they feature always-online modes, limited storage space, limited RAM, less-powerful CPUs.

Where we come from

In the quest for similarities between various types of applications of the Web standards, we need to embrace the history of the web penetrating the devices. We can treat the car or, specifically, the car infotainment system as another type of a device. Starting with HTML evolving into XHTML and its various mobile profiles, we encounter Compact HTML proposed by ACCESS in 1998 and rapidly adopted by W3C in 1999. The need for a standard satisfying the capabilities of the mobile hardware available at that time was fulfilled: i-mode conquered the Japanese wireless industry. A few years later the other continents adopted WAP and its WML was the basis for the monochrome user interfaces in mobile terminals. XHTML Mobile Profiles complemented the mobile specification landscape in the times of feature phones. But today's colorful and powerful smartphone environments have already less in common with the platform limitations related to the computing capabilities; from the web developer's point of view just the screen resolution, input modes and focus navigation remain the primary differentiators of the PC and beyond PC environments.

The need of standardization of Web access to a device results in various industry efforts, specifically in the mobile environment. In the mobile industry the initiatives of OMTP BONDI, WAC, GSMA OneAPI, W3C Device API Working Group and recently the Webinos are the evidences that the need to combine the web with the device functionality exists.

Automobile industry has not yet been so openly penetrated with the specific W3C web standards, the connected car term is quite young.

The goal of the Webinos Vehicle module and a similar initiative of the GENIVI Alliance could be summarized as the head unit scriptable object, similarly to other scriptable objects from the TV industry.

Similarities: Web & TV

In the home entertainment environment the primary application of the mobile terminal are the media and control sharing between various devices. The Web is present already on TV and Set-Top-Box (STB) devices, not mentioning its presence in the mobile devices. The second or companion screen solutions are now being standardized in the TV industry.

Competing for the user

A car may become an active component in the connected world contributing to the further expansion of the Web. Similarly to the home entertainment and TV environments where the mobile terminal becomes the new remote control, the same mobile device complements the IVI environment. Car infotainment system may need to compete or cooperate with the mobile device similarly to the home entertainment devices that are also exposed to cooperation with the personal device.

Taking the device competition case to the extreme, a head unit could be replaced by a mobile terminal, giving the drivers the feeling of almost complete car personalization. Imagine a docking station at the steering wheel instead of the usual console and indicators. Going even further, we could eventually think of and standardize a James Bond's car completely controlled via a mobile terminal, without a steering wheel, allowing it to become another gadget in our daily life.

The specification landscape

The above use cases are not a science-fiction anymore. The following are the already existing specifications that shape the scope of functionalities required to satisfy the potential requirements of the automotive industry:

- W3C Widgets technology provides the required security model and application packaging,
- UPnP and SSDP that deliver the discovery functionality are already part of the W3C Network Service Discovery draft,
- DLNA profiles UPnP to guarantee interoperability and to enable media sharing between the vehicle, personal device and home,
- W3C's HTML5 and UPnP/CEA Remote User Interface standards enable seamless compatibility of heterogeneous devices,
- Vehicle APIs enable creation of business models based on exposure of the in-vehicle device functionality via application programming interfaces,
- Remote User Interface (RUI) solutions based on UPnP, including MirrorLink from Car Connectivity Consortium, enable direct user operations via a separate device.

How ACCESS can help

For many years ACCESS has been delivering software stacks enabling the Web in the automobile world. The NetFront Browser - including its latest HTML5-capable WebKit-based NX version - and NetFront Living Connect, bring the Web, high-performance graphics, connectivity and media sharing to the vehicles that we use on daily basis. We at ACCESS are interested in further Web standardization in the automotive field.

How to proceed

W3C's role shall be clarified. As the industry body we are not far from personalizing the car and bringing the Web further to its full potential.

At the risk of oversimplification, we could state that the path of automobile into the W3C world resembles the route already taken by the home entertainment device into W3C. Starting with the activities of CEA and Open IPTV Forum with its DAE specifications via the HbbTv consortium we arrive at the W3C's Web & TV Interest Group. Vehicles starting with Webinos' Vehicle API, potentially backed up by the GENIVI initiative, may similarly end up using the potentially upcoming W3C standards.

Specifically a decision shall be taken whether in W3C we would like to (re-)define technologies or to focus on profiling, interoperability and testing of the already existing technologies.

The scriptable car objects, RDF/OWL for automotive, secure automotive-specific app stores and various existing car Web APIs summarize the subject of the Web in the automotive environment.

Following the W3C's TV Interest Group, a similar Automotive Interest Group could be established that could examine the existing work and could also potentially provide a cross-industry direction. The needs of various industry participants can already be clearly identified based on the expressed interests and roadmaps within other SDOs and their inputs.

