

Components & Devices Edition

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Impression

2012 GENIVI Outlook

by Egil Juliussen

The GENIVI Alliance had its membership meeting in Paris last week. I was invited as part of their analyst track and was asked to give perspectives on the potential future impact of HTML5 on auto infotainment. This is the third time I have attended and given a presentation at the GENIVI Alliance meeting. This impression will update a [previous version](#) that was done in early November 2011 and will focus on the following topics:

Is GENIVI still growing?

What is GENIVI focusing on?

How does GENIVI compete with other OS platforms?

What is the outlook for GENIVI success?

But first a quick explanation of what GENIVI is about. The GENIVI Alliance is a non-profit organization that is developing a software platform for in-vehicle infotainment (IVI) systems that uses Open Source Software (OSS) business model. The software platform is based on the Linux operating system and additional middleware that are needed for running automotive infotainment applications in head-units, telematics and navigation systems. The GENIVI platform can be based on any Linux distribution. To assure a high level of compatibility between Linux versions, GENIVI released its first edition of the compliance testing program in August 2011 after 14-month of development. The second version of the compliance testing program will be available shortly. Five Linux versions have passed the first compliance testing version:

MontaVista Automotive Technology Platform (ATP)

Wind River Platform for Infotainment 3.0

Mentor Graphics Embedded IVI

New Reports

Elektrobit

In most recent news, EB announced the expansion into the Chinese market with the formation of EB Automotive Software (Shanghai) Ltd, the legal entity in Shanghai. EB hopes the Shanghai office will serve as the new global hub to help EB support the company's growing automotive customer base in China and neighboring markets in Central Asia.

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Magneti Marelli

Magneti Marelli is the automotive parts and components company of the Fiat Group. Magneti Marelli supplies several navigation and infotainment headunits, mobile device interfaces and telematics control units to the greater automotive industry including PSA Peugeot-Citroen, Chrysler and Fiat Group brands.

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Canonical's Ubuntu IVI Remix

Linux Foundation's MeeGo IVI 1.0

Some auto OEMs have started to specify GENIVI compliant Linux versions as part of their future infotainment system RFPs. The first deployment of GENIVI compliant systems are expected in 2013 and 2014. The first auto OEMs to use GENIVI compliant systems are BMW, Jaguar Land Rover, Renault and PSA. The Cadillac CUE infotainment system that was first shown in October 2011 is based on the MontaVista Linux platform and could be considered to be a GENIVI beta version. The Cadillac CUE will be available in Q2 2012.

There are two indicators that GENIVI continues to grow. The membership a year ago was about 120 companies, which has now surpassed 160 for a 30% growth in the last year. The number of registered attendees at the GENIVI membership meetings has grown even more-from about 300 in April 2011 to over 500 last week or over 60% growth.

The best way to see what GENIVI is focusing on is to look at their Expert Groups (EG) since they are getting most of the development resources of the alliance. The list below is the Expert Groups that were active at last week's conference:

Media and Graphics EG (Audio, graphics, radio, Internet radio etc)

Location Based Services EG (Navigation, positioning, traffic info, etc.)

CE Connectivity EG (Bluetooth, device handling, etc.)

System Infrastructure EG (Bootloaders, initialization, program state management, etc.)

Networking EG (Networking, browser, etc)

Automotive (Vehicle buses, interfaces, etc)

Security (Software security etc.)

HMI Framework (Speech, control input, location, displays etc.)

These expert groups are defining the frameworks and APIs for how the infotainment applications will leverage and use the Linux OS and the many middleware software components. The member companies contribute knowledgeable people to these expert groups to define standards that are voted on by the membership when done. The expert group on HMI is a new addition that is being launched by GENIVI and it will be interesting to see what results come from this effort. The HMI is a major differentiation for auto OEMs, but is also a time-consuming development for most applications. By defining high-level HMI APIs and related standards, this will save on development cost and time, but retains the OEMs choice to define their own user

Foryou General Electronics

In early 2011, FGE announced that it officially entered the telematics market, targeting both OEM and aftermarket automotive segments. FGE has also built similar partnerships with China Unicom, Freescale, Microsoft and Huawei etc. for telematics development since January 2011.

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experience for infotainment systems.

GENIVI also has regional expert groups that are focused on topics and features specific to regions outside Europe and N. America. Currently GENIVI has a China and a South Korea expert group, but groups for India and Japan are expected to be approved in the future.

Another important function of GENIVI is the License Review Team (LRT), which manages the legal activities of the alliance. LRT is chartered to ensure that the technical work of GENIVI follows open source licensing requirements and policies. To accomplish this, LRT uses software code scanning tools to identify potential problems with contributed code that may violate other companies' copyrights or IP rights. GENIVI also helps the companies to understand which software features and components need to follow OSS rules and has to be shared versus which software components can remain their own and does not have to be shared with the OSS community. This boundary can be tricky to navigate and can result in unnecessary problems that can create legal risk for the auto OEMs.

The GENIVI platform competes with several other infotainment software platforms such as Microsoft's automotive OS platforms, RIM's QNX platform and the Android platform (modified to work in an automotive environment). It is difficult to compare the technical merits of these platforms and even harder to do cost comparisons of their development and deployment costs. Hence top down perspectives will be used for comparisons.

The infotainment software platform market battle is primarily between the two established proprietary platforms-Microsoft and QNX-and the two Open Source Software platform-GENIVI and Android. Microsoft and QNX platforms have been used for many years and many infotainment systems are based on these two platforms. Both Microsoft and QNX have spent many years developing and tailoring their platforms for the auto infotainment domain. For this work both companies are charging a licensing fee for each unit shipped. Both companies are continuing to improve their software platforms with new features and more middleware and are growing their third party supporters that can add more middleware and can provide infotainment applications that the auto OEMs can use. All of this software tailoring to meet an auto OEM's specification has significant development cost, that that is normally done by Tier 1s and companies specializing automotive middleware.

The OSS business model is different in the sense that the OSS platform and middleware components have no software licensing fees. However, the same tailoring of the OS platform and middleware has to be done to meet the auto OEM's specification for each infotainment system. The OSS platform tailoring is often done by the Genivi platform suppliers since they have the most platform expertise.

The platform tailoring can also be done by a combination of Genivi platform supplier and Tier 1s or some other combination of companies. In all cases the companies get paid for this tailoring work and this is the way the Genivi platform supplier gets paid-via professional services, but not via software licensing fees.

Currently, the software platform tailoring is more costly for GENIVI compared to QNX and Microsoft because GENIVI is still a work in progress. Microsoft and QNX tend to provide pre-configured software platforms that can save on total software development costs. As the GENIVI software infrastructure grows and become established, their cost will decline from both the experience base (learning curve effect) and from competition among GENIVI platform and middleware suppliers. The key question is how fast the cost of the GENIVI OSS approach tailoring will drop compared to the established QNX and Microsoft approach. There are, of course, many other factors that impact what software platforms the auto OEMs choose. These factors include software reliability, third party application availability, software support issues and specific platform features that are available at the decision time. Most of these selection factors are unique to each auto OEM and it is difficult to generalize how each platform compare.

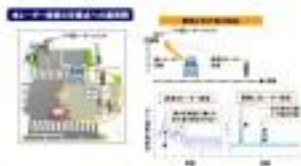
Android is a unique case as an auto infotainment platform. Android has been tremendously successful in the Smartphone industry, which has made it a potential option as an auto infotainment platform. The problem is that there is no company or organization that is making a standard Android IVI platform or at least provides some guidance that can avoid multiple and incompatible versions (from the apps viewpoint) that we have seen in the Smartphone industry. If there was a GENIVI-like organization for Android, it would become a formidable competitor in auto infotainment. Android could still become a strong competitor, but would probably be used as a proprietary platform by a large auto OEM. Or Android could be used by multiple OEMs, but each would be a tailored and incompatible versions.

An interesting development at the GENIVI meeting is that there were two session addressing the Android platform. One session discussed what drives the IVI community's interest in Android and the viability of Android as a complimentary OS or real-time executive (RTE) with GENIVI. Another session focused on whether GENIVI and Android could co-exist in IVI solutions and looked at the technical issues to do so. Another way for GENIV to leverage Android is to focus on the Android apps, which are mostly written in Java. These apps can be leveraged by using a Java virtual machine as part of GENIVI middleware. This has not been done by GENIVI yet, but is likely future event by GENIVI or one of its members.

The GENIVI outlook is good for several reasons. The Alliance has momentum and is making good progress in developing a software platform for auto infotainment applications. The business model of OSS has an advantage in platform software production cost since it is free compared to a license fee from QNX and Microsoft. Total software development costs are currently higher for GENIVI than for QNX and Microsoft. It is difficult to estimate if or when GENIVI may have similar or lower total software development costs than QNX and Microsoft. IHS Automotive believes this is a when question and it could happen in the 2015-16 timeframe.

In summary, GENIVI has made tremendous strides forward in a short time and will soon be ready for deployment. In a few years, GENIVI deployment stories will emerge and we will quickly know how it will do against current competitors. It is IHS Automotive's view that GENIVI will establish itself as a formidable competitor by 2015 and will take an IVI software platform market share in the 30% range or higher by 2020.

Recent News



Panasonic Develops New Millimeter-Wave Radar Tech for Low-Visibility

April 27, 2012 [Read Online](#)

Panasonic has announced that it has developed new millimeter-wave radar technology to detect objects such as pedestrians and vehicles in a range of several tens of meters. The new technology is able to detect both vehicles and pedestrians at the same time even though a human body reflects weaker radar signals compared to a car and cannot be detected at high resolution with the conventional millimeter-wave radar technology, which can be seen on ACC. Moreover, the new radar technology is able to detect the objects under low visibility conditions such as nighttime, snow, dense fog, and against sunlight, where optical and infrared camera and laser technologies have difficulties to detect the objects. According to Panasonic, this new technology is a part of its achievements for R&D of advanced 79GHz range radar system supported by the Ministry of Internal Affairs and Communications and will help reduce accidents when applied on traffic surveillance sensors installed at intersections for the next-gen traffic safety system.



Luxoft Unveils iviLink Software Platform for In-Vehicle Mobile Device Connectivity

April 25, 2012 [Read Online](#)

Luxoft, a member of IBS Group, unveiled its latest innovation, the iviLink connectivity platform at the 6th GENIVI All Member Meeting Conference. iviLink enables connectivity between mobile devices, such as smartphones and tablet PCs and vehicle infotainment systems including headunits, radio modules, rear seat entertainment and more. Two-way app integration between the car and mobile

devices allows the drivers and passengers to use their iViLink enabled apps from mobile devices with the car's headunit or rear-seat screens. The in-car remote control feature enables passengers to manage the vehicle's climate controls and car media with the help of a mobile device. Front and rear seat passengers can swap content while riding. The GENIVI-ready iViLink is compatible with multiple operating systems (Android, iOS, and Linux) and operates over numerous serial links (Bluetooth, Wi-Fi, USB, DLNA, and MirrorLink). The open source SDK will be available to download at no cost at www.ivilink.net.

u-blox Acquires 4M Wireless

April 24, 2012 [Read Online](#)



u-blox announces the acquisition of 4M Wireless. 4M Wireless designs and develops software and test solutions that are crucial for developing fourth generation (4G) mobile wireless devices based on the latest Long

Term Evolution (LTE) standards. The acquisition will give u-blox ownership of advanced protocol stacks that are licensed to chipset vendors whose products enable 4G user equipment for applications with needs for high speed data connectivity such as smartphones, tablet computers, notebooks and any other high-speed wireless modems. Also a variant of the products is licensed to manufacturers of 4G test equipment. 4M Wireless was founded in 2006 and has headquarters in the UK and operations in Lahore, Pakistan's center for technology and higher education. The company has been profitable over the past 3 years and will sell for approximately 9 million US Dollars. Closing is expected by September 2012.

IBM Teams Up with Asahi Kasei and Central Glass on EV Battery Project

April 23, 2012 [Read Online](#)



IBM has announced that Asahi Kasei and Central Glass will join its Battery 500 project team. IBM launched the project in 2009 to develop a lithium-air battery that could travel

500 miles (800 km) per charge. Asahi Kasei is a Japanese chemical manufacture and supplies separator membrane for lithium-ion batteries in the global market, and will contribute to develop a critical component for lithium-air batteries. Central Glass is a leading global electrolyte manufacturer for lithium-ion batteries and will contribute to create a new class of electrolytes and high-performance additives specifically designed to improve lithium-air batteries. Meanwhile, [as previously reported by IHS Automotive](#), IBM recently announced to cooperate with American Honda on an EV pilot project.

Autonet Mobile Partners with Bosch to Deliver IP-Based TCU

April 23, 2012 [Read Online](#)



Autonet Mobile announced a strategic partnership with Bosch's Car Multimedia Division to manufacture its IP-based telematics control unit (TCU). As [previously announced](#),

Autonet Mobile's automotive-grade device is built to be factory-installed and to access the vehicle's CAN Bus to drive the

development of in-vehicle applications including key fob, parental control and fleet offerings. With Autonet Mobile's TCU in place, automotive manufacturers can offer services such as the ability to connect the car to smartphones; parking and toll applications; and vehicle diagnostics. Autonet Mobile's IP TCU is built on the company's TRU Technology platform, which manages the vehicle on an IP network. The company is partnering with Bosch's Car Multimedia Division to manufacture an automotive-grade device that can be factory installed to speak directly to the vehicle's other systems as well as to external devices.



Parrot Wins Deal with German Car Manufacturer

April 19, 2012 [Read Online](#)

Parrot has announced its OEM technology is integrated into a new vehicle platform by a major German car manufacturer that is already a Parrot customer. The models equipped within this project are hatchbacks, coupes and sedans. The Parrot solution is currently available in cars sold in Europe before expanding to other markets during 2012. This solution includes hands-free telephony features, meaning it can handle and synchronize a phone book containing up to 5,000 contacts and can be paired with upto four different mobile phones. Further it offers a mobile internet connection using the customer's phone via the DUN and PAN protocols for internet access and to make use of the manufacturer's telematics services.



CSR Opens New Automotive Development and Applications Center

April 18, 2012 [Read Online](#)

CSR today announced the opening of the CSR Automotive Systems Development and Applications Center in Ingolstadt, Southern Germany. CSR acquired the facility, which was built by TEMIC Telefunken Hochfrequenztechnik GmbH, a provider of RF system solutions for infotainment and consumer products, as part of its merger with Zoran Corp. The investment in this facility is indication of CSR's ongoing commitment to this business. The experienced RF, hardware and software engineering team based at the new facility will allow CSR to continue to expand support and access for German and European customers to the entire CSR automotive product portfolio including location, connectivity and infotainment SoC solutions. It will also strengthen partnerships with automotive OEMs and key Tier Ones by offering greatly enhanced, design-in support and test infrastructure. The facility will also support increased marketing and business development activities across the region.



Wind River Offers Support for Android In-Vehicle Infotainment Systems

April 18, 2012 [Read Online](#)

Wind River has expanded its portfolio of Android offerings with the introduction of automotive-market specific software. Wind River Solution Accelerator for Android

Automotive helps in-vehicle infotainment device manufacturers shorten the development time of Android-based IVI systems. As the latest addition to the Wind River Solution Accelerator for Android series, the new automotive software adds to the existing medical, connectivity and user experience software collection. Key features include enablement of iPod/iPhone/iPad docking for multimedia capabilities, a customizable UI, and FM radio capabilities. Wind River's professional services provide an array of additional automotive capabilities and technologies such as hyperboot to reduce boot time of an IVI system, firmware management delivering updates to Android devices supporting online/offline update methods and Bluetooth IVI extensions to control personal phones via the IVI center console.

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