

# GENIVI ALLIANCE: DEVELOPING AN OPEN STANDARD FOR ALIGNING AUTOMOTIVE AND CONSUMER INFOTAINMENT CYCLES

Vince Holton talks open-source with Matt Jones,  
President of the Genivi Alliance

**I**T'S LIKELY THAT CONNECTED CAR'S READERS WILL FAMILIAR WITH THE GENIVI ALLIANCE, THE NON-PROFIT INDUSTRY ALLIANCE COMMITTED TO DRIVING THE BROAD ADOPTION OF SPECIFIED, OPEN SOURCE, IN-VEHICLE INFOTAINMENT (IVI) SOFTWARE.

**GENIVI'S PUBLIC PROFILE STATES THAT IT IS ADDRESSING IMPORTANT AUTOMOTIVE INDUSTRY NEEDS BY ADOPTING OPEN SOURCE SOFTWARE METHODOLOGIES AND BEST PRACTICES AND PROMOTING OEMS AND TIER 1S USAGE OF THEIR OWN TECHNOLOGY ROADMAPS, BRANDING AND BUSINESS MODELS. TO LEARN MORE ABOUT THE ORGANISATION'S PRACTICES, GOALS AND OVERALL VISION FOR CONNECTED CAR TECHNOLOGY, VINCE HOLTON SPOKE TO MATT JONES, PRESIDENT OF THE GENIVI ALLIANCE. WHEN NOT WORKING ON GENIVI PROJECTS, JONES IS DIRECTOR OF FUTURE ENTERTAINMENT, JAGUAR LAND ROVER.**

**VH:** What are Genivi's objectives in the connected car space?

**MJ:** We have been going for 7 years and currently have about 130 active members. In the last 12 months we have expanded the free and open-source vehicle interaction project within the first areas of

connected car. When I say the first areas, I mean that so far we have been seeing lots of proprietary solutions coming out that are copying what has been happening in mobile devices and personal computers for many years. The Remote Vehicle Interaction project aims to provide free and open source solutions in three main areas. The first is being able to securely remotely control a car - i.e. how can I send instructions to a vehicle, or an embedded device within a vehicle? The second is how you securely enable an over the air software upgrade (OTA) for the vehicle, and the third one is how we can get all of a car's data into the cloud and allow people to use that standardized communications protocol in order to build the next generation of features.

The really good thing about the Genivi Alliance is that it is not a product, it is a set of building blocks that people develop products on top of, without new learning, and developers can pick up building blocks and turn those into a product. So, with the software OTA solution, for example, it focuses on providing some software management to the back end, puts files in places and tells the software which cars or devices need to be updated, and you get a report back. Genivi members like Bosch or Ericsson can then use the product if they wish, without needing to start their own project. ▶



The interesting part for Genivi has been that as we have been developing this communications protocol, we have been getting a lot of interest through the Genivi start-up programme – universities and so on – and we have ended up developing free and open-source instances in the cloud as well, so that you don't even need to get involved with developing a database. It really is an accelerator to get people using the next generation connected automotive features.

**VH: And has the reaction been positive?**

**MJ:** The reaction so far has been fantastic. We have the healthiest expert group within Genivi and already they have demonstrated the first active, working code - and all within 6 months. It is exciting to see companies such as Harman's Redbend working on this, because there is recognition that proprietary based solutions can't last, that ultimately the IP is going to be implemented on top of the transport mechanisms, and that it will help the industry to be able to lean back on an open-source industry standard.

**VH: How 'open' to the concept of open-source software have you found the automotive manufacturers to be? Have you been fighting 'walled garden' thinking?**

**MJ:** We have been working in open source from an embedded software perspective since we were formed, and in reality in discussions for 9 months before that. The important thing is that with open source we are not trying to take away people's right to IP. What we want to be able to do is give them the tools to accelerate creation of the new and innovate features that the car driving public wants.

I've asked at many conferences and events "who has ever bought a car because of the operating system?" Very few people have ever put their hands up. Very few people buy cars because of the OS. All cars use petrol or diesel and perhaps electric. All cars use a very similar set of components to make them work. All factories use the same tools to put cars together. Why wouldn't they use the same software building blocks, standard building parts that are not part of what differentiates a BMW from a Volvo or a Jaguar? Ultimately, by using open source software, it allows everyone in the automotive ecosystem – be they an OEM, or a Tier 1, or a new player that wants to corner the market with a new media player – to build their products faster and – crucially – to keep up with consumer electronics. It is the same as Samsung and LG selling mobile phones that look a little different and have different added values, but are based on the same underpinning Android software platform. So car companies can do the same, and this is Genivi's mission. OEMs and Tier 1s should be able to focus their resources, and should not have to be reinventing new radio players or software stacks. They should be able to focus on creating new and innovative differentiating features to give customers real choice.

We have been able to build an understanding amongst the members that if you take software developed within Genivi, and you enhance it, then you give something back. So Harman may end up using something that has been developed by Bosch, building on it, and then what Harman has added is also used by Bosch, and perhaps Continental or BMW – and whoever. That's all OK, because each of these members is passing on enhancements somewhere else.

**VH: This seems to be similar to the very unusual, collaborative and un-selfish ecosystem that was created amongst members in the early days of the Bluetooth Special Interest Group (SIG) in the connected device market, where seemingly competing members actually rolled their sleeves up and worked together to make Bluetooth technology and the Bluetooth SIG better and more**

**powerful. Bluetooth is now massively successful and has more than 30,000 members. Does Genivi share the same ambition and is this achievable in the automotive sector?**

**MJ:** We had that ambition, and now we are achieving it. We have a compliance specification, we write standards and we have multiple expert groups looking at multiple different areas of the infotainment system - e.g. media players, device connectivity, telephone stacks, navigation. We have code and reference implementations and over 2,500 engineers subscribed to our technical mailing list - and far more subscribed to the business related lists. As well as that, we release two updates to the compliance specification per year, so we are really running at consumer electronics industry pace with this. That is important as we need to understand how to interface with the consumer electronics industry.

I've not been personally involved with the Bluetooth SIG, but I believe that Genivi is now becoming an order of magnitude larger than some of the more exacting groups. We're also starting to have inter-alliance collaboration with the likes of the World Wide Web Consortium (W3C), the Open Mobile Alliance (OMA). They and other industry trade associations are coming to us, requesting cooperation. That's a really good sign. We also have close ties to the Linux Foundation – I am on the board of that organization.

**VH: There are signs, then, that open-source is becoming more accepted. How significant do you consider Toyota's announcement that it will adopt Ford's SmartDeviceLink software, with PSA following on, and others such as Honda, Mazda and Subaru apparently considering doing so too?**

**MJ:** SmartDeviceLink is a Genivi product, and so that is great, and shows how Genivi technology is being adopted widely. Ford and Toyota are not Genivi members, but anybody that uses an open-source Genivi product, anybody that contributes back – whether a Genivi member or not – is very welcome. It is great seeing open-source being used by multiple car companies, across multiple continents. We are not at all concerned that Ford and Toyota are not Genivi members, and ultimately, we hope that more car companies will adopt open-source.



**VH: Do you regard Genivi as a standards organization? Your collateral talks of projects and developing software, but is it Genivi's goal to define, maintain and regulate a documented standard in the way that bodies like the Bluetooth Special Interest Group, Wi-Fi Alliance, AllSeen Alliance do?**

**MJ:** Genivi is a code-lead, reference implementation. We don't believe in creating a standard on a piece of paper and then writing the code to meet standard. We believe in looking at what open-source code is out there and creating a standard based on that, as well as using standards that we can code to for modules that don't exist. If you can imagine a binary star system, and specifications orbiting code, that is close to the Genivi model.

We are all about enabling in the car the lifestyle that we have become accustomed to with our smart mobile devices. For this reason we are pulling stacks and technical specifications from organisations such as the Bluetooth SIG, the Wi-Fi Alliance, AllSeen, translating their technology into automotive.

**VH: In comparison to the PR 'noise' in the automotive sector that currently surrounds development of advanced driving assistance systems (ADAS), development in infotainment seems to be**

relatively low-level, or at least there is less noise. Would you say that OEMs are focusing more on ADAS, and diverting engineering resource to develop ADAS systems?



**MJ:** No, not at all. They are very distinctly different engineering teams and different skillsets. It's like the difference between the person programming the operating system in a handset and the person programming the operating system in the cell tower. It's that different. I would say, though, that Genivi recognises that in the future there will be autonomous (and semi-autonomous) vehicles. At that point, the driver will need more to do than they do today and in a safe environment. That's where the IVI system kicks in. Similarly, we recognize that the ADAS systems of tomorrow will need fantastic and secure connectivity to the web. Genivi is developing that through various of our projects. The information provided by the IVI is critical to ADAS and future features. We want our building blocks to not only benefit the IVI systems, but all of the systems in the vehicle.

**VH:** What alignment is there between the consumer/mobile device manufacturers and the Genivi Alliance, and what will this bring?

**MJ:** This goes back to meeting customer expectations. It's good to see that CarPlay and Android Auto have come along. The customer may be using an Apple or Android smartphone or something else, and wants that to work effectively with the vehicle. The great thing is that we already have wrappers and open-source projects so that the Android Auto and CarPlay interfaces work perfectly on a Genivi stack – in Android Auto's case, the wrapper was available within 3 months of Android Auto being released. Needless to say, because of the proprietary nature of Android Auto and CarPlay, while the wrapper is open-source, it does not allow you to download a fully working system without the agreement of Google or Apple. This is, though, where we need to be. Genivi needs to be a free and open-source operating system that enables whatever the customer expects. The customer could, of course, be the end-user of the vehicle, or any of our members.

**VH:** How does MirrorLink compare to Android Auto and CarPlay – is it competing or complimenting?

**MJ:** From Genivi's perspective, MirrorLink also works well on a Genivi platform. Ultimately it is up to the car company or Tier 1 to consider what their customer will need. SmartDeviceLink, MirrorLink, Android Auto and CarPlay are all equally important projects within the Genivi Alliance, and Genivi is scalable from the smallest display in a low-cost car to the multiple display systems now being installed in premium cars.

**VH:** The consumer electronics industry, though, traditionally moves a lot faster than the automotive industry. How will the Genivi Alliance enable development of in-car technology to keep pace with developments in the consumer world?

**MJ:** It's about alignment. Ultimately the car is a big, mobile device. That is how the customers see it – a big mobile device that interfaces to other mobile devices. We have gone beyond copying what is going on in the mobile device world, we are cascading requirements into the other alliances that are developing the next generation of tech for the consumer world. Then we will rapidly integrate emerging standards into the Genivi stack to ensure that all of automotive meets the customer's requirements and expectations.

**VH:** Security has been in the news. The stories we have been hearing about vehicle systems hacking have mostly identified the IVI system as the hacker's route into the vehicle. Does Genivi see security as an area on which it has to focus?

**MJ:** Of course. As well as having a dedicated security team, we have security in mind when developing all of our open-source solutions. Because Genivi is not a product, and because it is based on open-source, Genivi is based on the best open encryption that you would use for banking or defence. Genivi's isn't a proprietary description of security. The way I would describe it is to imagine you had a safe designer who designed a safe. The safe designer then got all of the other safe designers and some safe crackers to review the design of his safe – over and over again – until all of the safe designers and the safe crackers involved agreed that there was no possible way of getting into that safe. At that point the designer says that his design is free for anyone to use. This is the open-source model.

I would say that there are, of course, proprietary security technologies, and everything that Genivi does allows proprietary IP to be used as well. Once you use that proprietary technology to build your safe (technology that has not been peer-reviewed by thousands of people) someone can learn how to breach that safe's proprietary security and may well put the knowledge up on the web, and then everyone will know, as we have seen in the automotive and other industries.

One of the things we are talking about inside Genivi at the moment is that while this open-source encryption is really good, if someone did manage to crack it, you can track that fairly quickly. Then, if there was a proprietary 'safe' inside that encryption that somebody had chosen to put into the product and that nobody had ever seen before, this could create a good 'onion-like' security. Even if you were the 1 in 50 million people that could get through the open-source encryption and were confronted by something that nobody had ever seen before, that is good, and that is the way that the industry is going.

**VH:** OK, let's finish off with this. Genivi seems to be doing well at the moment. How are you going to maintain momentum? Is there sufficient commitment from the membership – and enough committed, big, powerful companies - to make full-time management of a standard sustainable on a long-term basis?

**MJ:** We've proven since we started out in 2009 that we do what we set out to do. Our membership has been growing, and has now stabilised, which is to be expected based on our knowledge of the size of the industry. We have code commitments coming in all of the time. We are not just seeing the first products based on Genivi being launched, we are seeing the second and third generations actually driving on the roads today. We are here for a while, to say the least. Our mission doesn't have a defined goal or an end-stop. We will continue to expand our activity, because, as new technologies and new features are developed in consumer electronics, in order to meet customer expectations we have to track and implement that technology in Genivi and subsequently in cars.

I don't believe that innovation in the mobile device industry is going to slow down any time soon.

[www.genivi.org](http://www.genivi.org)