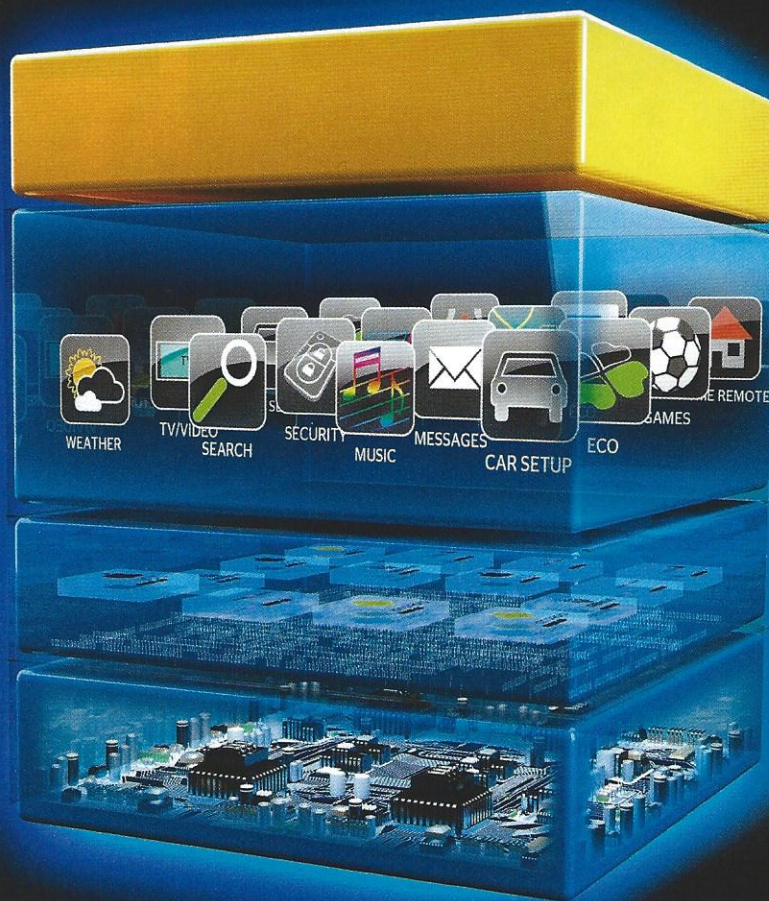


Openness breeds creativity

The use of open-source software promises to bring new brains into the industry and will enable OEMs and suppliers to add functions and to update systems faster

By James Scoltock



Lars Schultheiss

Head of innovation for infotainment and connectivity, Continental



An open-source infotainment platform will make it easier for developers to create functions. The beauty of the system is that new developments such as application programming interfaces (APIs) are being created which will become standards for everyone that participates – developers, suppliers and OEMs. Those standards will then add to reusability which helps to bring down development costs.

The main advantage over proprietary software is that open-source has the power to attract a bigger development community. If you look at Android for smartphones you will see how this could work.

The main challenge is to get more manufacturers to commit to series projects. Once we reach a critical mass, more functionality will come almost immediately.

Connectivity is the crucial point behind a lot of developments. An open-source platform will change the vehicle from a

closed to an open system and the car will enter the API economy.

Developers will be given open access or even provided with interface descriptions and a software development kit to help them write applications. But control will take place through standardised requirements and system integrators such as Continental.

I don't think that the human-machine interface (HMI) will change dramatically. We need to make sure that it's safe and doesn't add to driver distraction. This can only happen by integrating infotainment into the entire HMI logic of a vehicle.

We want to avoid scenarios such as where the infotainment system is reading an email to the driver while they are approaching a dangerous situation. So we need to link infotainment to driver-assistance systems and the interface to the driver.

This is why we see open-source mainly as a middleware, which enables a great variety of functions but allows enough flexibility to adapt the HMI.

Because of increased processing power we will see a lot more integration of new functions. We've already demonstrated how to use multicore hardware to integrate camera-based assistance

Many layered approach: Apps developed by third-party coders will enable OEMs and Tier Ones to improve functionality

features such as surround-view on the infotainment system. Another trend is to integrate the instrument cluster with the infotainment systems in order to be more flexible on the HMI across different displays.

With more integrated infotainment systems we will be able to create connected functions that improve safety. The basic principle behind this is that vehicles will communicate to enhance digital maps. Realtime information will come directly from other vehicles' systems – such as control units for brakes – the infrastructure or other content providers, such as suppliers of traffic data in the cloud. But having a bigger data exchange between vehicles and the cloud also means that safety and security requirements will play a more important role.

Open-source will be impacted by this just as other systems are. We need to define connected functions as tightly as possible in order to be effective with security policies or hypervisor virtualisations on multicore hardware.

Joel Hoffmann

Strategic development manager of in-vehicle infotainment, Intel



The benefits of an open-source platform are great. It gives access to a robust developer community that is anxious to get involved with the automotive industry and

potentially have an impact on the production of a vehicle system.

The advantage is that a free development model allows for faster innovation and creation of new usage cases not otherwise offered within the structured automotive environment.

OEMs tend to leverage absolute control over their suppliers and employees, whereas in the open-source environment a much more flexible and supportive approach needs to be taken.

In GENIVI, it was confirmed that the first implementation of an open-source project leading to production would actually take longer and may cost more in its first iteration. OEMs and suppliers are learning from this experience that a subtle tweak in the interaction with the open-source community can change this to a time-to-market advantage rather than a loss.

The HMI that will sell is one that is safe as well as easy to use. It takes the same amount of creative energy to produce this in open-source as in a closed-source model. Many OEMs have decided that this area will be their way to differentiate. However the consumer will decide whether a familiar phone interface or a branded car experience will be of most value to them.

Surprisingly, the car requires much more processing for infotainment delivery, given the complex audio experience and large number of inputs and outputs. As vehicle electronics continue to grow, open-source software promises to help keep pace with the increasing complexity.

Security isn't a significant challenge as the most secure systems in the world include open-source code. The process of testing and validation is actually enhanced by the methodology, and meets industry requirements as products are built. Security is an area where the OEMs have a great opportunity to differentiate themselves.

Thomas Carmody

Head of automotive connectivity, CSR



Suppliers basing their systems on open-source will need to ensure that their intellectual property sitting on top of the component software is protected from

"Open-source has the power to attract a bigger development community, as you see with Android for smartphones"

general public licensing (GPL). Managing security vulnerabilities such as intellectual property from GPL licensing, and the costs associated with checking that the code is compliant with open-source licensing terms, has been a problem in the past. However this has become less of an issue recently as solutions such as Linux prove themselves to be robust enough to be used as operating systems in the automotive market.

Another challenge, especially for OEMs, is the collaborative nature of the open-source work. Some have a natural inclination to avoid these types of collaborative efforts in case they weaken their position in the market relative to the others. There's also a reluctance to fully embrace an open-source environment as companies are reticent to open up their own intellectual property.

Once lower-layer hardware enablers such as host interfaces for pulse-code modulation have been developed within the community, these components will be reused, and with reuse comes

reliability. Contributors also fully understand that these components have to be designed with automotive quality in mind. There is a strict process by which components are developed and tested, whether it's by system-on-chip vendors, middleware vendors or Tier One suppliers.

Ford and GM are good models of how developers can be engaged to bring new applications to the platform. Last year Ford opened up its Sync AppLink tools and APIs to developers. And GM launched its own app framework platform that underlies its MyLink and IntelliLink systems.

Once developers have incorporated the Sync AppLink code into a proposed app, they submit it to Ford engineers for review. They will certify whether the app is bug-free and appropriate for their vehicles. Once approved, Ford will work with the developer to provide a distribution licence and get the app on the market.

This model shows how developers are engaged enough to build apps for the platform while Ford still controls the overall specification and experience. ■

Lab test: Using open-source code can improve robustness

