

innovation

Designing infotainment systems for the **connected** generation

By: Nick Palmen

A fresh generation of new car buyers who grew up with the Internet are entering the market. They expect their cars – like their phones and PCs – to be “connected”. Buying decisions from entry level to the top end will be made on how the vehicle supports a “connected” lifestyle rather than the traditional buying triggers of power and looks.

OEMs have recognized the trend and have partnered with companies such as HARMAN, which was recently contracted by some of the biggest OEMs to supply next-generation connected infotainment systems for the “connected generation” market.

Sachin Lawande, HARMAN, CTO and Co-President, Automotive, talks about the need for innovation to meet the demands of the connected generation.

My new position as Co-President of the company and also the chief technology officer for HARMAN reflects our focus on innovation. Over 12 years ago, we practically invented the infotainment

Sachin Lawande, Co-President of the Automotive Division at HARMAN.



system as it is today. Our biggest success in the past was combining CD, radio player and navigation in a single integrated system. It was complete innovation at the time as the first infotainment product in the industry as we know it. We are also responsible for many other innovations, including the technology that is in effect the basis for audio and infotainment in the vehicle, such as mobile infotainment device connectivity, voice dialogue systems, multimedia players, telephone/telematics solutions, analogue/digital tuners and receivers and rear seat entertainment. We see ourselves as technology leaders. We are suppliers to the top carmakers, such as Audi, BMW, Daimler, Ferrari, Lexus, Peugeot, Porsche, Toyota, Chrysler, Dodge, Jeep, Land Rover and Hyundai.

AI: You recently signed contracts totaling around US\$1.5-billion with the likes of BMW, Toyota and Fiat-Chrysler. What is the significance of these contracts?

Lawande: It brought us two companies who have not been our customers of infotainment systems in the past - Toyota and Fiat. We had a relationship with Chrysler, but not with Fiat, and with Toyota we were supplying audio, and now for the very first time we are supplying infotainment. For Toyota and Fiat to award us ahead of their current infotainment suppliers is significant.

I think the question is “why is HARMAN successful in winning this new business?” We were always known for our capability at the high-end infotainment systems for luxury vehicles. For several years, HARMAN has been a key supplier to virtually all European luxury car manufacturers, and has around 80% of the market. At the same time, OEMs are realizing the value that we are putting in the cars.

About two years ago, at the start of the recession, we decided to design new infotainment system architecture from the ground-up. We wanted a scalable system that is able to deliver all required features, such as navigation, connectivity, multimedia, and car functions - but at all points on the cost-value curve. The new breed of consumers, who are accustomed to accessing the Internet via mobile devices such as Smartphones, do not want a dumbed-down version of connected device in their cars.

The next-generation scalable infotainment system was designed to anticipate the convergence of infotainment with other consumer electronics devices such as Smartphones, and leverages key trends from the silicon and software industries.

AI: Why is the new system better than what is already in the market?

Lawande: It brings the kind of features customers are demanding into systems at price-points that were not possible before. It is a truly scalable system. What was really remarkable for us when we started designing the system was that the silicon



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In-cockpit split view.

and the Smartphone vendors were headed in the same direction as the infotainment industry. There was a convergence of ideas. We partnered with silicon vendors to align their roadmap to the specific needs of the automotive industry. By leveraging the trends in silicon that are designed for the high-volume and fast-evolving Smartphone market, we were able to achieve much better feature-cost levels than competitive products.

On the software side, we had to make a strategic decision with respect to connectivity. Will the car continue to be primarily an island disconnected with the rest of the Internet, or would it be part of the Internet? We believe that the future of infotainment applications are more in the Internet connected domain, and the entire system must be designed to achieve this from the lowest levels. It is like creating the next connected platform such as the iPhone or Android, but designed with the specific requirements of the automotive industry in mind.

In building the software for this next generation system we leveraged key technologies from the open-source community, which has been spectacularly successful in developing most of the connected software for the Internet. This makes the HARMAN next generation infotainment system much more advanced in terms of software architecture & capability than any other such system on the market.

AI: What features does the system support?

Lawande: This new system brings high-value features such as 3-D graphics, video decode, and wireless connectivity to the broader segment of the market. The system offers high-quality navigation, multimedia, and connectivity features that were only available in the high-end systems before. It supports wireless integration with smart mobile devices such as iPhone, Blackberry, and Android - based smart phones to deliver new “mobile office” features such as e-mail, SMS text messaging and calendar functions.

Another trend that helped us is that the silicon process technology is evolving very fast, and you can integrate a lot more on a chip today than in the past. We were able to integrate the 3-D graphics, video decode, and wireless capability down to a single chip.

This system also offers the ability to download new applications similar to Smartphone apps. This enables highly customized applications to be developed for the car to offer safety/security, messaging, or convenience features.

We are also working on the next generation navigation technology based on the latest advanced speech processing technology, which will enable drivers to send and receive messages verbally for safety and convenience. Full control of applications on the Smartphones will be available through the infotainment system.

AI: What new developments can we expect from HARMAN?

Lawande: The next-generation scalable infotainment system will be the underlying platform of the future “connected car”. HARMAN is driving innovation in two areas – integration with smartphones, and connectivity to the Internet using technologies such as 3G/LTE. All applications in the car, such as navigation and multimedia, will be able to leverage Internet connectivity and enable access to personalized content at home or in the cloud.

Smartphone integration will initially focus on communications applications such as E-mail and SMS. The goal is to make access to these apps safe and convenient in the car through use of the latest speech processing technology, which will enable drivers to send and receive messages verbally for safety while driving. In the future, full control of applications on the Smartphones will be available through the infotainment system.

The future infotainment system from HARMAN will also offer the ability to download applications from the Internet which will customize & personalize the system far more than what is possible today. And we will achieve this without having to worry about the effects on the rest of the system as in-car systems must have the kind of reliability that customers have come to expect.

To conclude, innovation is about the delivering the same “connected” experience inside the car that users get outside. We will continue to drive forward with our best high-end infotainment capabilities that define comfort and luxury, as well as the mid-segment, which is about delivering exceptional value for price for the lifetime of the vehicle. **AI**

