# Digital Lifestyles Take to the Road

Open Platforms Drive Seamless Integration Between Home, Car and Office

In-Vehicle Infotainment (IVI) applications have evolved from novelties to "must-have" options as consumers now view the digital lifestyle as an around-the-clock part of daily life. Pervasive use of smartphones, digital radio, Internet, DVD video and MP3-based systems, and mainstream availability of discrete GPS navigation systems and roadside assistance services are driving demand for a new level of IVI systems, designed to provide an integrated, upgradeable control point that serves not only the driver, but the individual needs of all occupants. The challenge for the automotive industry is how to meet this demand seamlessly, quickly, and cost-effectively.

Broadly defined, "infotainment" refers to all digital applications that can be used by occupants of a vehicle, including internal connectivity, navigation and location-based services, external communications, and radio. This technology acceleration, combined with the digitization of video, voice and data, and the evolution of the Internet, has brought IVI systems to a tipping point. The car is now an environment where digital-savvy consumers expect an uninterrupted experience of their digital world, complete with personal connections, business productivity, their favorite entertainment and up-to-the-minute information.
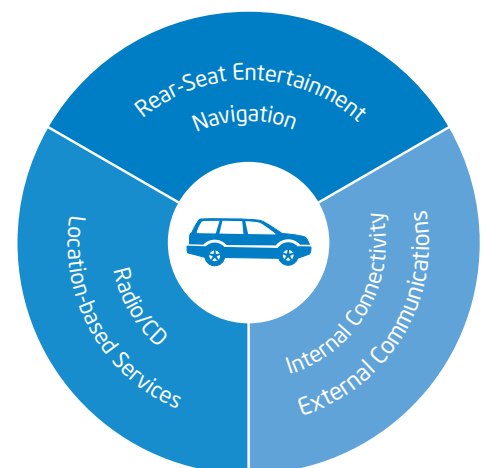
Intel® Solutions. Ready for the Road Ahead.

Intel's standards-based embedded building blocks for IVI applications are ready for the road, helping the automobile industry, aftermarket product manufacturers, and consumer electronics vendors meet the needs of today's digital lifestyle. A new generation of ultra-compact embedded computing and communication platforms provides vehicle occupants the same degree of connectivity and access to digital media and data that they currently enjoy in their home or office.

Intel® architecture-based platform solutions — coupled with extensive hardware and software from a large community of developers — enable rapid, cost-effective development of flexible and scalable IVI systems, today. Meanwhile, Intel® technology and market leadership continue to power industry innovation.

In-Vehicle Usage Models

Working Smarter

Things are busy at work, and fortunately you can accomplish quite a bit before you even get to your desk. Your cell phone automatically connects via Bluetooth* to your Intel®-based infotainment system, so you can use voice commands to dial and make calls completely hands-free. You verbally command the system to connect to your company's communication server so you can listen to your voicemail and e-mail messages, using text-to-speech synthesis software. Utilizing the same translation software, you can IM coworkers completely hands-free. Now, your work day is off to a good start, even before you arrive!

The Family Vacation

The destination may be great, but getting there can be long and tedious for the kids. Before leaving home, instruct your Intel-based infotainment system to auto-sync with your home media server to download their favorite tunes, along with the TV shows they recorded the night before. Now, they can listen to their latest music mix while playing their favorite multiplayer PC games in the backseat. They can watch the TV shows they recorded, watch live TV over the system's Internet connection, and even IM their friends. Now, the fun starts as soon as you hit the road!

A Smoother, Safer Ride

An IVI system, powered by Intel, makes it easier than ever to get to your destination, with vivid graphical maps, options for satellite imagery, and clear directions. Passengers can select points of interest from the front or back seats, and the system will update your route plan on the fly. Upon request, you'll get verbal turn-by-turn directions while the system intelligently mutes the stereo. As your fuel level gets low, the system can automatically connect to the web and provide directions to the least expensive option. In the future, intelligent safety systems will advise drivers about changing road conditions including weather alerts, traffic, road closures and accidents. Vehicles will even communicate with other vehicles, sharing information on highway alert and emergency systems, to provide a safer journey.

IVI Trends Unlock Opportunities for Consumer Electronic Products

The "digital car" is becoming the natural and seamless extension of the digital home and office. Use of standards-based building blocks for IVI platforms will drive seamless mobility and stimulate new opportunities for developers of in-vehicle consumer products:

Navigation and location-based services: GPS-based 2-D and 3-D map displays with route and directional information, points of interest and other location-based information and services.

Pervasive wireless connectivity: Wireless personal area networks based on Bluetooth or Ultra-Wideband technology, wireless local area networks based on Wi-Fi (802.11) technology, and wide area networks including WiMAX and 3G/4G cellular services.

Rear-seat entertainment: Video-based games and on-demand video applications to support the growing popularity of rear-seat multimedia entertainment systems, including systems that satisfy individual preferences of multiple users.

Seamless interoperability: Standards-based consumer electronics products for the digital home and office with IVI interoperability in mind, including video and audio content, MP3 audio, and connections for cell phones and PDAs.

Needed: Flexible and Scalable In-Vehicle Infotainment Systems

Different users will demand a unique and discrete set of features. Common processor architecture across IVI platforms is necessary to achieve the scalability, upgradeability and flexibility required for the efficient rollout of these capabilities and usage models.

- **Integrated platforms:** IVI systems may be installed by the manufacturer and purchased with the vehicle, or purchased and installed by the consumer as an aftermarket product.

- **Communications gateways:** Car kits for mobile devices will connect audio from a cell phone or MP3 player to the vehicle's audio system for hands-free control.

- **Ultra-Mobile PC and Mobile Internet Devices:** Includes small, ultra-mobile devices with PC capabilities, Internet access and location adaptability.

Why Intel?

With Intel-based platforms, you benefit from an interoperable, open development environment, to deliver exciting new IVI capabilities quickly and cost effectively.

- Common hardware and software throughout the entire value/development chain — from complementary silicon vendors to board manufacturers to operating system and application suppliers — gets you to market more quickly than proprietary platforms, even under resource-constrained conditions.

- Utilizing standard-based Intel architecture as a base platform, you can add layers of software as needed to enable exciting new infotainment usage models — no need to overhaul hardware and software with every new design. In addition, Intel's open standards address in-car operating conditions, as well as the quality and reliability requirements of car manufacturers.

- The Intel® Embedded and Communications Alliance, Intel's extensive third-party development network, can dramatically cut time and cost to deliver, deploy, and upgrade complete platform solutions by letting you choose from a wide range of applications, software, operating systems, and technical expertise at a variety of perform-ance, functionality, and price points (intel.com/go/eca).

Customers want their digital lifestyles to flow effortlessly and seamlessly between home, car and office. Intel architecture enables this while meeting stringent automotive requirements for temperature, quality, energy-efficient performance, and enhanced technology longevity.

- Intel architecture is highly interoperable with existing consumer electronics solutions, such as hand-held devices, desktop PCs and laptops, as well as with technologies such as Wi-Fi, Bluetooth, cellular, and WiMAX, ensuring that IVI system manufacturers will be aligned for interoperability with seamless integration and connectivity.

- A scalable set of complementary building blocks lets OEMs and after-market providers design with headroom for future application development. Thanks to extensible Intel architecture, future consumer electronics products will be able to coexist with cars still on the road five-to-10 years from now, with only software upgrades.

- Intel platforms deliver the CPU speed and performance-per-watt needed to run the most demanding applications, simultaneously.

Summary

It has been said that today's consumers live in a screen-to-screen world, which is to say they want to be connected, productive and entertained wherever they go. Intel's technology leadership and established ecosystem provides consumers with the same digital lifestyle advantages in their cars that they currently enjoy in their homes and offices. Seamless integration will provide consumers with a consistent experience, wherever they go.

Let Intel's technology leadership, commitment to quality and volume manufacturing capabilities put you on the road to the future. Learn how Intel solutions for in-vehicle infotainment systems enable rapid, cost-effective deployment of the value-added products that consumers want.

For more details and the latest updates, contact your Intel representative, and visit us online:
www.intel.com/go/infotainment