AltmanVilandrie & Company

Infotainment on the Move

The Future of In-Vehicle Consumer Infotainment

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INTRODUCTION

While not everyone can ride the Google Shuttle to work and enjoy a free WiFi connection, in-vehicle Internet access for all is not far off as cars roll into the digital age. In-car access to everything from real-time traffic updates to favorite iTunes songs and YouTube videos will transform the driving experience for drivers and passengers.

As Americans own more than 230 million vehicles and typically spend more than one hour in their cars daily, the vehicular infotainment market has significant potential. Prospects for auto infotainment can be likened to the strong growth in the home and mobile markets during the past few years. A broad array of new auto infotainment services is coming to market to enhance everything from the morning commute to long family road trips. These developments are exciting, as they free consumers from the PC, TV, and small cell phone screen and keypad while enriching the in-car experience and improving passenger safety.

Innovation and technological convergence are driving the changes in the auto market. Just as technology continues to expand mobile and home entertainment capabilities, new service features are enabling in-vehicle infotainment to move beyond existing devices like radios and CD and DVD players. Mobile TV on cell phones and TV web-based services (e.g., AppleTV and Xbox 360) have pushed existing services to new areas of our lives. In the auto, mobile phones, navigation devices, and MP3 players are beginning to integrate into existing in-car audio and video systems. For example, new Bluetooth wireless technology services allow drivers to see incoming caller IDs in their rear-view mirrors and use the car's audio system as a speakerphone. Looking ahead, emerging technologies, like advanced wireless networks and simplified in-vehicle user interfaces, will enable a full range of on-demand in-vehicle infotainment services, including TV shows.

Importantly, these advancements are breaking down traditional barriers to competition in the automotive market. As Internet connectivity and on-demand content become more essential to the consumer, auto manufacturers and aftermarket vendors are reconsidering how they deliver infotainment to consumers. Meanwhile, the door is open for new competitors, such as wireless carriers, that can now extend their services into the automotive market for the first time. Auto infotainment can—and should—fully integrate into the on-demand world that already exists in the home, office, and mobile environments.

AUTO INFOTAINMENT SERVICE DELIVERY METHODS

While auto manufacturers and aftermarket vendors are starting to provide new in-car connectivity capabilities and on-demand content, it's not easy. To date, no company has achieved significant mass-market adoption.

So what factors will contribute to success? The service delivery method will be crucial to winning strategies. Future delivery methods will enable access to entirely new types of in-vehicle infotainment, and they represent a substantial, untapped opportunity for all players.

As demand for ubiquitous, on-demand content continues to grow, two distinct service delivery methods are emerging: Mobile Radios and Embedded, In-Vehicle Radios. It's important that competitors understand the strengths and weaknesses of each model, along with value chain roles available to each player.

Exhibit 1

In-Vehicle Information and Entertainment Options.

Real-Time In-Vehicle Infotainment Options

Mobile Radios

- ***Current Devices:*** Cell phones that can transfer calls or their content to a car stereo system

- ***Future Devices:*** In-Vehicle user interfaces controlling cell phones/data cards with DSL-equivalent data connections to access advanced services

Embedded In-Vehicle Radios

- ***Current Devices:*** Embedded receiver for terrestrial radio and satellite radio (W/TV capabilities)

- ***Future Devices:*** In-Vehicle user interfaces using "cellular" radio chipsets and antennas built into vehicles or aftermarket products to access advanced services, including internet content.

New products from each delivery model are already emerging. Using the cell phone as a mobile radio, aftermarket vendors such as Road Master and Visteon offer products that allow car stereos to play web-based and commercial on-demand audio content (e.g., podcasts and mobile music services). Vehicular radios are also evolving. Dash Navigation, an aftermarket vendor, will bring basic Internet connectivity to cars starting next year.[1] This past year, Sirius introduced "Backseat TV" with Chrysler[2], providing family TV fare in the vehicle through a simple, easy-to-operate video service. In this paper, we take a look at both service delivery models and explore performance and value chain considerations of each.

SERVICE DELIVERY METHOD #1: MOBILE RADIOS

Cell phone capabilities continue to expand as the handset evolves into a personalized touch point for consumers' daily activities. Cell phones are used for everything from receiving phone calls and email to controlling home security and voting for an American Idol contestant. The cell phone could also become a mobile radio for the automobile.

Performance Considerations

A mobile radio enables several compelling services that are not feasible with current vehicular infotainment delivery methods, including access to on-demand and real-time content. Some services will satisfy consumer impulses, such as providing access to their favorite music or videos on-demand from a home multimedia server or with a commercial service. Other potential services uniquely satisfy the needs of motorists, such as real-time traffic updates for navigation.

The cell phone is already starting to serve as a gateway for automotive infotainment. Aftermarket manufacturers, for example, offer affordable products that allow a driver to use the car's audio system as a speakerphone. A cell phone also enables impulse buyers to download songs to their phones and immediately stream the music to the car stereo using Bluetooth technology. After your favorite bands' concert, you can skip the long lines for their latest CD and download the songs with your cell phone in your car. Once the music is on your cell phone, you could pipe it through your car stereo speakers, allowing all your friends to rock out to the song and giving you a jump on the traffic jam.

Despite tremendous opportunity for cell phones to serve as mobile radios, their access speeds and user interfaces must vastly improve if they are to compete with CD's, DVD's and other infotainment products. Many companies are pursuing this opportunity. As early as next year, WiMAX networks from Sprint and Clearwire could raise user download speeds above 1.5Mbps, providing DSL-quality download speeds. With future 4G wireless networks, user download speeds may exceed 10Mbps, enough throughput to stream HD video programs (using MPEG4) to flat panel screens in cars. In terms of the user interface, Ford's and Microsoft's Sync product includes a central, interactive screen built into the dashboard that is easier to navigate than a small cell phone screen and keypad. This centralized screen provides controls for navigation, music players, cell phones and vehicle monitoring. Aftermarket manufacturers, like Streetdeck.com, are also creating centralized, software-based control panels. While these products are just starting to become available, mass-market solutions are on the horizon.

Exhibit 2

With Ford Sync, consumers can operate a variety of consumer electronic devices using their voice or the vehicles' entertainment controls. Sync will work with all Ford radios, including those without interactive screens.

Value Chain Considerations

Although the technological capabilities of the mobile radio are clearly within sight, the right business model for this device will be a challenge. For example, are consumers willing to pay a premium to transfer content from their cell phone to their car? Will car manufacturers and aftermarket vendors see value in enabling these services? How can mobile carriers best capture additional revenue within the auto sector? Players targeting the auto infotainment market must consider these and other questions as they adapt their businesses.

Chances are slim that consumers would pay an additional $40 per month for a new "vehicular data plan" in addition to their data plans for their mobile phone and PC cards. However, consumers already show a willingness to pay an incremental $10 - $15 per month per service for satellite radio services, consumer telematics services, and GPS navigation features on mobile phones. For the modem mobile, a similar amount would provide the subscriber access to the full range of Internet and cell phone content on the vehicle's ergonomic and high performance navigation, stereo and video systems.

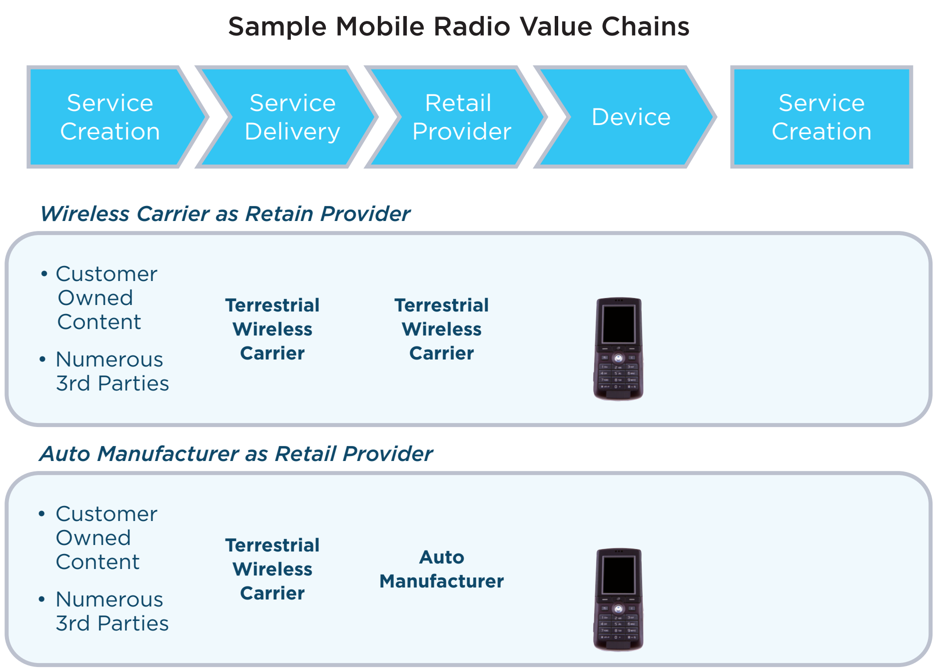
A successful business model will require cooperation between vehicle manufacturers and wireless carriers. With Sync and similar software systems, auto manufacturers can provide authentication functionality and user-friendly interfaces that create the value-added experience to justify premium car prices, incremental hardware prices or even a portion of the retail service revenues. Wireless carriers' handsets would provide network connectivity and connect to the software system via a USB cable or Bluetooth, insulating the vehicle software from reliance on a particular cellular technology. Given wireless carriers' existing service provider role and customer relationships, they would likely serve as the retail provider of the vehicular data plan, and assume responsibility for ongoing care and billing.

Under this business model, wireless carriers would sell supplemental auto services in conjunction with their existing offers. For instance, a Verizon Wireless subscriber might sign up for VCast and a vehicular data plan. Depending on consumer demand, real-time traffic and other services may be value added features, or packaged with the basic vehicular data plan.

Of course, other business models could also emerge. Each auto manufacturer could provide their own value added "widgets" and services on the user interface. However, the closer auto manufacturers move toward becoming a retail provider, the more they tread outside their areas of core competency. With a new software-based user interface that can be sold as a premium feature, auto manufacturers may feel more confident yielding the service provider role to wireless carriers. The new user interface enables them to capture significant value and maintain control of the driving experience.

Exhibit 3

Mobile Radio Handset Value Chain.



SERVICE DELIVERY METHOD #2 – EMBEDDED IN-VEHICLE RADIOS

Once high-speed wireless access and an enhanced user interface are available, the mobile radio could give way to an embedded in-vehicle radio and antenna that connect directly to a wireless network. Currently, such products are widely available for terrestrial and satellite radio services. With Sirius' "Backseat TV," a limited broadcast TV service is also available. In addition to a few technical differences between the mobile radio and in-vehicle radios, the in-vehicle radios could significantly alter the dynamics of the business model discussed above.

Performance Considerations

Despite superior performance relative to mobile radios, in-vehicle radios have more hurdles to overcome before they are a practical option. In particular, an in-vehicle radio is unlikely to support the latest wireless air interface standards because their lifecycle is much shorter than a car's lifecycle.[3]

Value Chain Considerations

Because an embedded in-vehicle radio eliminates the need for a cell phone, this service delivery method simplifies the entry of satellite radio providers. Sirius and XM may be able join the terrestrial wireless carriers as potential network access providers, depending on spectrum constraints. Both satellite radio and terrestrial wireless carriers are well-positioned to provide retail services as they already maintain the necessary billing, care, and other support functions for a subscription-based service.

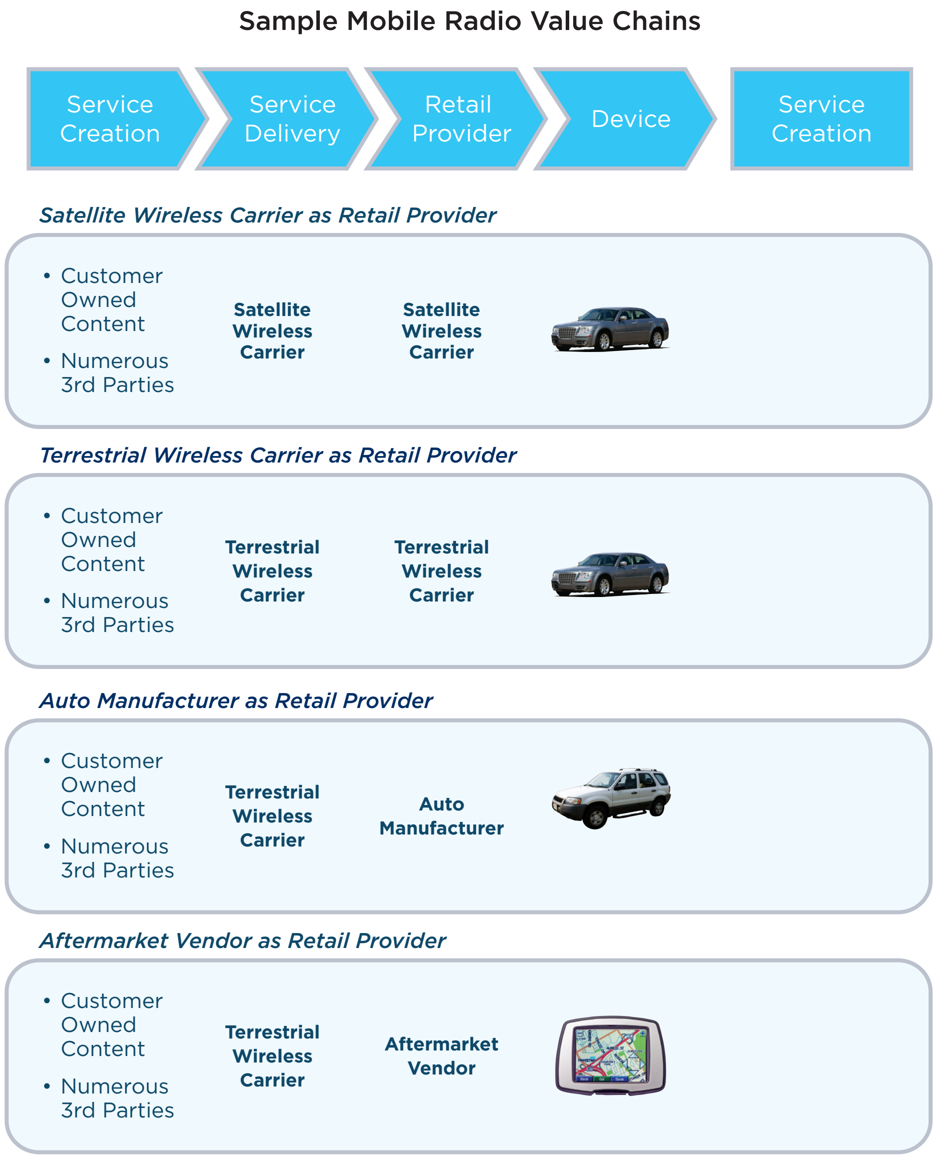
Satellite and terrestrial wireless carriers, however, could also provide wholesale services if auto manufacturers or aftermarket vendors create successful retail services. General Motors' OnStar and Dash Navigation's retail plans provide two examples of this business model, where the car manufacturer or aftermarket vendor manages the marketing and customer relationship.

Yet, most of the car manufacturers currently lack billing and customer care capabilities and experience, not to mention an existing base of subscribers. The most successful example of a subscription-based in-vehicle infotainment service is satellite radio with more than five million OEM subscribers in addition to millions of aftermarket subscribers. In the satellite radio business model, auto manufacturers do not assume the role of retail service provider. Also, auto manufacturers have limited experience in offering and supporting services that extend beyond the vehicle into the home and mobile environments.

Thus, the business model for the in-vehicle radios may be similar to that of the mobile radio, with wireless carriers operating as retail providers. Even if auto manufacturers are not retail providers, they have more leverage with an in-vehicle radio delivery method than a mobile radio paradigm. The in-vehicle radio eliminates the need for cell phones and increases the number of wireless carriers that may be interested in agreements with auto manufacturers (e.g., XM and Sirius). Muni WiFi projects, the Vehicle Infrastructure Integration (VII) plan, and other initiatives may further increase the wireless network options. These alternative networks could strengthen the negotiating positions of the auto manufacturers and aftermarket vendors.

Exhibit 4

Embedded In-Vehicle Radio Value Chain.



SUMMARY

Despite a traditional lag in entertainment technology adoption, the car is a highly attractive environment for on-demand infotainment consumption. The auto's physical infrastructure is ideal for a high quality infotainment experience – ubiquitous audio systems and a growing number of video screens complement a culture that is increasingly viewing the car as an extension of the living room.

Demand for Internet connectivity and live video content will likely usher in a range of new services and experiences. The service delivery method will be critical to success; and, mobile radios and in-vehicle radios represent two primary options. Both require cooperation between wireless carriers and auto manufacturers or aftermarket vendors. Even though Sirius' Backseat TV service already uses an in-vehicle radio method, the mobile radio may be better able to keep pace with advanced wireless network technology. With either option, the wireless carriers' existing business places them in a natural position to fill the retail service provider role. Yet, new technologies and internal initiatives may enable the vehicle manufacturers and aftermarket vendors to play a greater role in retail services and capture a greater portion of the revenue.

The growth opportunities within in-vehicle infotainment are significant, and market players will likely employ both service delivery methods to some extent. The greatest beneficiaries will be those companies that create a sustainable business model, which satisfies consumers' growing demand for ubiquitous, real-time infotainment.

REFERENCES AND SOURCES

[1] Dash Navigation has demonstrated its web search capabilities in partnership with Yahoo! Local. Commercial units are scheduled to become available in Q1 2008.

[2] Sirius is starting with three channel offerings – Disney, Nickelodeon, and the Cartoon Network.

[3] Hypothetically, software-defined radios could enable over the air upgrades once new wireless air-interface standards are deployed. However, technology that enables the seamless upgrade of chipsets is not yet perfected. Relative to auto manufacturers, aftermarket equipment vendors' shorter product lifecycles give them an advantage in managing wireless devices.