Microsoft Windows Not Part of Sync 3

Ford Goes with Panasonic and QNX

Sync 3, Ford’s third-generation Sync infotainment system, will be based on QNX from Blackberry, not Windows Embedded Automotive from Microsoft as with Sync 1 and Sync 2. According to Ford, the QNX operating system makes more efficient use of memory and computing power. When an infotainment design goes to production, carmakers like to have no more than 60% utilization of microprocessor power and memory. But with Sync 2, hardware utilization was north of 80%, leaving little room for product extensions. QNX is seen by Ford as a versatile, efficient and extensible platform backed by an organization where there is dedicated support.

Ford and Microsoft broke a lot of new ground with their first Sync platform, which in 2007 pioneered device connectivity and the speech user interface. Ford broke more ground in 2010 with its Sync 2 (MyFord Touch and MyLincoln Touch) development by bringing system integration in house. But Sync 2 has been much criticized for being glitch prone and difficult to operate, so Ford’s decision to bring in a tier-one supplier, Panasonic, seems warranted. Harman was also in the running for Sync 3.

Ford is not at all done with Microsoft, but wants to work with the company differently going forward. Ford has been trying for many months to find a company to take over maintenance of the Sync 2 software. That work is still being done by Microsoft, but Ford would rather have Microsoft’s help with innovation and the support of Microsoft’s rich portfolio of technology, for example its cloud expertise.

Microsoft’s engagement with the auto industry has been uneven over the years. Given the recent organizational changes, both at the top and in the auto group, a reevaluation of its automotive commitment is likely underway.

Android before iOS in the Car

As technology giants Google and Apple focus on extending their reach into the car, Google has made far more progress than its rival. Both companies have efforts underway to make devices based on their respective operating systems more compatible with vehicle head units. Google has gone a step further by showing a willingness to adapt its Android operating system to run the vehicle’s head unit, potentially replacing QNX, Linux or Windows.

At the January 2014 Consumer Electronics Show, Google, along with Audi, GM, Honda, Hyundai and Nvidia, announced the founding of the Open Automotive Alliance (OAA) aimed at making Android devices compatible with head units. Apple introduced iOS in the Car at its Worldwide Developers Conference in June 2013, and announced that Honda, Mercedes, Nissan, Chevrolet, Kia, Hyundai, Volvo, Jaguar and other OEMs would be integrating some of its features.

While Apple’s and Google’s objectives are similar, the impression each company is making on the auto electronics community is very different. People who have seen iOS in the Car describe the software as “half-baked” and Apple’s approach to the industry as arrogant. In contrast Google is said to be more accommodating, indicating it is willing to adapt Android to make it more useful to carmakers. The software developed by the OAA is expected to debut in a production vehicle as early as the end of 2014. Nobody is saying if and when iOS in the Car will find production.

Open Automotive Alliance

Drivers would love to be able to safely and easily use smartphones in their cars, and carmakers are keen to offer cars that let them do that. Eighty percent of smartphones now run some version of Android, so carmakers are open to working with Google to integrate an Android platform in their infotainment systems. About a year ago Google suggested that rather than customizing Android for each OEM, an alliance of carmakers working together could share the development work and the resulting specification and software code. Thus the Open Automotive Alliance was born, modeled after Google’s successful Open Handset Alliance that developed open standards for mobile devices.

Initially the OAA will create extensions to the Android platform so Android mobile devices can run car-specific apps. The car apps will be modified and simplified to avoid driver distraction. The community of Android app developers is huge, and carmakers would love to get them innovating on their behalf. As part of this initial step, the alliance will develop a software client for the head unit so apps running on mobile devices can make use of the vehicle’s display and be controlled from the vehicle’s touchscreen and knobs.

The OAA’s next task will be to extend the Android platform so it can run on the head unit, along with the existing operating system if that suits the OEM. That will be Audi’s approach, according to Mathias Halliger, chief architect for infotainment systems at Audi, a key member of the

Why Make Android the Head Unit Operating System?

Carmakers want to offer connected vehicles with a broad choice of apps that are safe and easy to use. If the apps are run on the head unit, carmakers will be in control. Carmakers have less control over apps run on mobile devices.

- Android is the world’s most popular mobile platform.
- It’s a platform that is well known to thousands of experienced developers.
- By accessing a large community of developers who can write applications for their vehicles, carmakers hope to spur innovation that brings customers to them.
- Popular apps based on Android could more easily be adapted for automotive use.
**Roundup 2013: Autoliv, Bosch, Delphi, Lear**

**Autoliv**
2013 Sales: $8,803 million  
Change from 2012: up 6.5%  
2013 Operating Margin: 8.6%, nearly the same as 2012  
Outlook for 2014: Autoliv expects organic sales growth of approximately 5% and a modest increase in operating margin.  

Sixty-five percent of sales were airbag products; seatbelts accounted for 32%. Growth was especially strong in sales of active seat belts and knee airbags. Active safety, especially radar-based products, was the fastest-growing product line but accounted for just 4% of total sales in 2013. The company expects to grow active safety sales by 20% per year over the next two years to reach $500 million in 2015.

While sales were well balanced regionally, Asia, primarily China, became Autoliv’s largest sales region for the first time, accounting for 34% of total sales. Sales in China increased by 25% year over year and accounted for 16% of Autoliv’s total sales in 2013. According to Autoliv, the average safety content per vehicle in China was approaching $220 in 2013, compared with the global average of $300 per vehicle.

In the coming year Autoliv plans to invest in expanding production in growth markets like China and in becoming more vertically integrated.

**Bosch Automotive Technology**

Preliminary figures—final results will be released at the end of April. Because of accounting changes, 2013 figures are only partially comparable to 2012. Results from 50:50 joint ventures are no longer included.

2013 Sales: €30.7 billion  
Change from 2012: up 7%  
2013 EBIT Margin: Approximately 8%, compared with a 4.5% EBIT margin in 2012

Automotive Technology outperformed Bosch’s three other reporting sectors—it was the only sector where sales increased. Automotive accounted for 66% of total sales. The company cited significant growth in both gasoline and diesel direct injection and in the Car Multimedia division’s displays and infotainment systems. Bosch sees penetration of gasoline direct injection systems reaching 18% of global passenger vehicle production by 2015.

Among Bosch’s new product launches in 2013 is smartphone integration software called mySPIN. Developed by Bosch Soft-Tec, mySPIN creates and links an automotive version of the smartphone apps to the vehicle display where they can be used by the driver.

Since 2011, Bosch has been very publicly promoting its strategy to become a key player in the emerging Internet of Things connected devices and services market. A new Bosch company, Bosch Connected Devices and Solutions GmbH, was created in December 2013, with headquarters in Reutlingen, Germany, and offices in India and China. Bosch will initially target smart homes and naturally, appliances, and hopes to later expand into connected vehicles, transportation, industrial and the energy and building technology sectors.

**Delphi Automotive**
2013 Sales: $16,463 million  
Change from 2012: up 6.1%  
2013 Adjusted Operating Margin: 10.2%  
Outlook for 2014: Delphi expects revenue growth in the range of 6%, to at least $17,200 million assuming global vehicle production increases by approximately 3%. Operating margin is forecast in the range of 11.3% to 11.6%.

**Lear Corp.**
2013 Sales: $16,234 million  
Change from 2012: up 11.4%  
2013 Operating Margin: 5.2%, unchanged from the prior year  
Outlook for 2014: Lear expects sales in the range of $16.9 billion to $17.4 billion with operating margins up modestly to approximately 5.4%. Lear’s forecast is based on North American light vehicle production reaching 16.8 million units in 2014.

Lear’s Seating segment generates nearly three-fourths of Lear’s revenue. As the second largest independent seating supplier globally, Lear’s only major competitor is Johnson Controls.

Sales in the Electrical segment grew by 19% in 2014, reaching $4.2 billion or 26% of total sales. Lear manufactures electrical distribution systems and components for conventional, hybrid and electric vehicles. Lear attributes the strong growth to new business and higher unit production on some key platforms. The new business comes from roughly ten geographically diversified customers and covers some twenty programs including wiring terminals and connectors, junction boxes and electronic modules. Lear’s two largest customers, GM and Ford, each accounted for 22% of Lear’s sales in 2013.

**Segment Results**

**E/E Architecture**
2013 Net Sales: $7,972 million, up 17%  
Adjusted EBITDA Margin: 15.5%

**Powertrain Systems**
2013 Net Sales: $4,424 million, down 5%  
Adjusted EBITDA Margin: 15.2%

**Electronics and Safety**
2013 Net Sales: $2,830 million, up 4%  
Adjusted EBITDA Margin: 14.0%

**Thermal Systems**
2013 Net Sales: $1,468 million, down 5%  
Adjusted EBITDA Margin: 5.4%

According to Delphi, its 2013 growth was fueled by increased sales in North America and especially in Asia, offset by a 6% decline in Europe.
Android...

OAA. “We are not looking for a new operating system. We have one. We are looking for a platform that provides some integrated APIs (application programming interfaces) for our head units,” he said.

But while Audi may not be ready to change its head unit’s operating system, other carmakers will be replacing their QNX or Windows operating system with Android, said Danny Shapiro, Nvidia director of automotive marketing. “We actually have Android in the car programs in development, right now, running on our Tegra processor. One of the OAA’s objectives will be coming up with a better experience with Android running natively on the car’s head unit.”

According to Mr. Halliger, “There were some early attempts by infotainment suppliers to base head units on the Android spec that was created by the Open Handset Alliance. But simply squeezing and changing the mobile standard was not an idea supported by Google. The OAA is completely different. Now Google is listening to the automotive industry and is willing to adapt the Android platform in a way we can use it in our automotive systems.”

So that it can work productively, the alliance initially will be kept small, limited to the founding members. New members will be brought in once the development has stabilized, possibly within the year. Any code will first be available to members only. Once it is released it will be made available on a Google website.

Beyond the OAA

Separately from the OAA, Harman International has been working very closely with Google on behalf of a large carmaker whose next-generation infotainment system will be based on the Android operating system. “We will be one of the first users of that technology in a shipping product,” said Sachin Lawande, Harman Infotainment Division president. “We’ve all been beating the drum about the connected car. Android takes that one step forward, because now you have a platform on which to run the apps the connected car will bring.” Once the alliance opens its membership to tier-one suppliers, Harman plans to join.

Other infotainment systems running Android are in the queue, for example Fujitsu Ten has been working on an infotainment system based on Android for the 2016 Honda Civic.

In 2009 Continental was developing AutoLinQ, an Android-based, next-generation infotainment and connectivity solution, which proved to be ahead of its time. The development was shelved in part because of the difficulties in fitting Android to automotive requirements, and for lack of customer interest. “But now things have changed,” said Lars Schultheiss, in charge of strategy for Continental’s Infotainment business unit. “Seeing the pressures coming from the market, car manufacturers want to offer more automotive apps and make their infotainment systems more flexible over time. But the situation with Android hasn’t changed. Developers will still have to make significant modifications to make it usable for the car.” Continental says it now has technology that can accommodate the Android operating system while fulfilling the requirements carmakers place on such systems.

The application manager for Nissan’s new Infiniti InTouch system, available on the new Q50, is based on the Android SDK. It supports Android apps that will eventually be available in 100 countries. Application management, downloadable native applications, SDK and support are being supplied by Connexis. The apps run natively on the vehicle’s head unit independently from the driver’s brought-in device. An InTouch app available now at Google Play allows drivers to use tailored versions of Facebook, Google Search and Pandora with the in-vehicle touchscreen and steering wheel switches.

iOS in the Car

“The name, ‘iOS in the Car’ is very misleading,” said Michael O’Shea, president of Abalta Technologies. “It is not running the head unit. Basically they are implementing an AirPlay-like solution. Everything is running on the phone; it is just a screen projecting onto the head unit.”

That view is seconded by others who have seen iOS in the Car demonstrated. We are told that Apple wants to be able to show the driver whatever apps are running on the iPhone, but initially Apple is going to focus on just a few things, like its map, phone and media interfaces. People who have seen demonstrations of iOS in the Car tell us that every frame of graphics sent to the head unit display is compressed before it is sent and then decoded. The result is 3D maps look like 2D maps with long latencies.

“It is a very Apple-centric user interface,” said Mr. O’Shea. “You can imagine the situation where the OEM has put a lot of work into creating a very nice look and feel, specific to them, and then you go into the iOS in the Car mode and find yourself in Apple land.”

Audi’s Mr. Halliger has been talking to Apple about how to improve the user experience. “There are a couple of things to solve. If progress is made of course we will put iOS in our cars. It is up to Apple. Google is the opposite. Google is very flexible, very open.”

We have tried to get Apple to make an interview partner available to The Hansen Report to explain its intentions for iOS in the Car and tell us when the software will be ready for prime time, but Apple isn’t talking. Roger Lanctot, Strategy Analytics’ quick-witted industry watcher, was not afraid to speculate on why Apple isn’t talking: “When you don’t know what you are doing, maybe it’s best to keep your mouth shut.”

Google’s Motivation

By extending their reach into cars, Apple, and especially Google, stand to profit greatly. Google’s core business is advertising. In 2013 Google’s advertising revenues rose to more than $50 billion, with $7.5 billion of it coming from advertising on mobile devices. Were Android to gain a significant foothold in cars, with more eyes and ears on Google products, that number would rise significantly.

Audio advertisements could be sent to drivers who agree to receive push notices based on their location. Passengers could receive audio/visual ads. With Android onboard, drivers would be more likely to employ Google Maps and navigation to find points of interest, yet another source

Continued from page 1

Continued on page 8
SiriusXM Revenue and EBITDA by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>EBITDA (in $ millions)</th>
<th>Adjusted EBITDA Margin</th>
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<tr>
<td>2008</td>
<td>1,664</td>
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<tr>
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<tr>
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<tr>
<td>2013</td>
<td>3,799</td>
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<tr>
<td>2014*</td>
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*Guidance

2008 to 2013 CAGR: 17.3%
2010 to 2013 CAGR: 10.5%

Free Cash Flow by Year

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<tr>
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<th>Free Cash Flow (in $ millions)</th>
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<tbody>
<tr>
<td>2009</td>
<td>185</td>
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<tr>
<td>2010</td>
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<td>2011</td>
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<td>2013</td>
<td>927</td>
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<tr>
<td>2014*</td>
<td>Approaching 1,100</td>
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*Guidance

2009 to 2013 CAGR: 49.6%

SiriusXM Revenue by Source

<table>
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<th>Source</th>
<th>Revenue (in $ millions)</th>
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<tr>
<td>Subscribers</td>
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<tr>
<td>Advertising</td>
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<tr>
<td>Equipment</td>
<td>2.1%</td>
</tr>
<tr>
<td>Other</td>
<td>9.1%</td>
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</tbody>
</table>

Total 2013 Revenue: $3,799.1 million

Background

In 1997, the United States FCC (Federal Communications Commission) auctioned two SDARS (satellite digital audio radio service) licenses to broadcast in a 25 MHz band of the S-band it allocated for commercial satellite radio. One license was purchased by American Mobile Radio Corp., which became XM Satellite Radio. The other license was secured by Satellite CD Radio Inc., which became Sirius Satellite Radio. The XM license was purchased by American Mobile Radio Corp., which became XM Satellite Radio. The other license was secured by Satellite CD Radio Inc., which became Sirius Satellite Radio. XM launched its first satellite in 2001; Sirius launched its first satellite in 2000.

After years of high operating costs accumulated losses by both companies, Sirius and XM merged, despite the FCC’s initial prohibition against one licensee gaining control of the other. (It took the FCC more than a year and a half to approve the merger.) Sirius bought XM in a $3.5 billion deal that received final FCC approval in July 2008. XM shareholders received 4.6 shares of Sirius stock for each XM share they owned. Trading of XM stock was stopped on July 28, 2008. Shares of the combined company, now named Sirius XM Holdings Inc., are traded on the NASDAQ under the symbol SIRI. Both SDARS licenses are now held by the new entity.

While the new company was able to reduce operating expenses and refinance some of its substantial debt, the timing of the deal coincided with the start of the Great Recession and global decline in automotive sales. In February 2009 SiriusXM received a $530 million loan from Liberty Media Corporation in exchange for 40% equity in the satellite broadcaster. Liberty Media continued to buy up shares of the company and took control in early 2013. Today Liberty Media holds approximately 52% of shares. In January 2014 Liberty Media offered to take over 100% of SiriusXM and make it a wholly owned subsidiary.

Standard & Poor’s gives SiriusXM a long-term debt rating of BB. Two rungs up from speculative grade, BB indicates that the company is “less vulnerable in the near term but faces major ongoing uncertainties to adverse business, financial and economic conditions.” According to another S&P report, the company faces “longer-term vulnerability to competition from alternative media.”

Satellite Radio

SiriusXM’s primary source of revenue is subscription fees for its radio broadcasts. The company operates a fleet of ten orbiting satellites, five in the Sirius fleet, four from the XM fleet and one in-orbit spare. Despite the merger of the two companies, SiriusXM must continue to operate both systems for the foreseeable future. To shut down either one would obsolete millions of radios already in the field. XM radios are not able to receive and decode signals coming from the Sirius satellites and vice versa. The company supplements its satellite signal coverage with approximately 700 terrestrial repeaters. In addition, SiriusXM offers Internet streaming radio for a monthly fee.

Today, about 24% of the cars on the road in the U.S. have satellite radios. In the
next five years the company expects satellite radio installations will increase from 60 million vehicles today to 110 million in 2019. Monthly subscriptions to SiriusXM start at $9.99 per month for more than 80 channels of mostly music. Subscribers who receive more than 140 channels of music and talk radio pay $14.99 per month. In 2013 SiriusXM received average monthly revenue per subscriber of $12.27. That figure is calculated by dividing monthly subscriber revenue plus advertising revenue by the average number of subscribers.

SiriusXM has agreements with every major carmaker through which it subsidizes radio installations and offers new car buyers free trial subscriptions. Last year 44% of owners and lessees of new vehicles who received free trial subscriptions converted to self-paying subscribers after the initial promotion period. The company expects to offer a total of more than 15 million trial subscriptions, in both new and used vehicles, in 2014. The 2013 average monthly churn—self-paying subscribers who gave up their subscriptions—was 1.8%.

SiriusXM makes royalty payments to music copyright holders and performers. Performance royalty payments as a percentage of gross revenue are increasing by a half a percentage point per year: from 9% in 2013 to 11% by 2017. It is not at all certain where it will go from there. Pandora pays royalties equivalent to roughly 70% of its revenue for licenses from songwriters and performers, according to industry estimates.

SiriusXM’s market is maturing, which means revenue growth will slow in the long term. The growth in the number of paying subscribers has slowed from 8.3% per year in the period 2009 to 2012, down to 5.9% per year from 2012 to 2014, according to the company’s forecast. The number of subscriptions that were deactivated increased 11% in 2013.

While many of the people willing to spend $147 per year, plus or minus, to listen to audio entertainment have already been found, the number of paying subscribers continues to rise, despite intense competition. New car sales have been robust, and the satellite radio option is being offered in more models, including high volume, lower priced cars.

“Ever since we launched, we’ve always had a lot of competition,” said Stephen Cook, executive vice president of sales and automotive. “AM/FM is free. You’ve got iPods, CDs and now Internet radio. We are accustomed to competing very effectively against all the competition. The reason our business continues to stay strong is we are easy to use—you can hop from expertly curated commercial-free music channels, over to live sports events or comedy, live news broadcasts by all the major news channels, talk and entertainment channels or the most comprehensive Latin programming in radio. No Internet service offers the same breadth of content. Our other big pull is we offer credible hosts that present the music, live concerts and other exclusive features that you can’t get anywhere else. Internet radio tends to be more like a jukebox.”

Some examples of the exclusive audio entertainment SiriusXM offers include E Street Radio, a 24/7 curated Bruce Springsteen channel, the popular Howard Stern show and the Grateful Dead channel, a channel co-produced with the band. Patrick Reilly, senior vice president of communications for SiriusXM, said: “We offer more than 70 music channels, all of which are commercial free. Many of the music streaming providers have business models based on advertising, not unlike FM radio. The biggest complaint from people listening to music on the radio in their cars is that there are too many commercials. Our subscribers never have to face that.”

Still, SiriusXM’s competition for both listeners and advertising will get more intense. The percentage of smartphone owners who have listened to an online radio stream from a cell phone connected to a car stereo is growing dramatically, from...
SiriusXM Radio

6% in 2010 to 21% in 2013, according to 2013 research from Arbitron and Edison Research.

Alternatives to SiriusXM will become easier to access in the future as the penetration of infotainment systems grows. Infotainment systems are still in their infancy, says Arbitron and Edison Research: Just 6% of respondents have driven or ridden in a car with in-dash information and entertainment systems, not surprising considering the average age of light vehicles on U.S. roads today is 11.4 years, according to R.L. Polk.

SiriusXM has been acquiring an increasing number of subscribers through the sale or lease of previously owned vehicles with factory-installed satellite radios. Used cars made up about one million of the company’s gross subscriber additions in 2012, and that number grew to 1.5 million in 2013. The company has agreements with many carmakers to market subscriptions to purchasers of certified pre-owned vehicles. In 2013, 34% of used car buyers with trial subscriptions converted to paying customers. The company expects that eventually more new subscribers will come from the used car business than from new cars.

SiriusXM CEO, James Meyer, sees no reason why 15% or more of the vehicles on the road shouldn’t have his company’s premium radio service. According to R.L. Polk there are 247 million vehicles on the road in the U.S. today. With 25.6 million subscribers, SiriusXM penetration today stands at 10.4%.

Satellite Receiver Modules

SiriusXM designs the modules that receive and decode the satellite radio signals. Head unit manufacturers such as Harman and Clarion incorporate those modules into the audio systems they supply to OEMs. By subsidizing the cost of the satellite radio, SiriusXM encourages carmakers to install them in new vehicles. The modules are comprised of a semiconductor chip set and software. In 2013, 10.7 million satellite receiver modules were installed in new light vehicles produced for sale in the U.S.

Despite improving the module over the years with more memory for longer signal buffering and the capability to receive additional stations, SiriusXM has been able to reduce the cost of the modules. The module cost shows up significantly in the company’s subscriber acquisition cost (SAC), which have declined from $70 per subscriber four years ago to below $50 now. The SAC also includes commissions paid to carmakers as incentives to purchase, install and activate satellite radios in their new vehicles. The chips come from STMicroelectronics and others.

Connected Vehicle Services via Agero Acquisition

“We are huge believers in the connected car,” said Mr. Meyer in a recent teleconference with securities analysts. “One of the greatest things about our business relationships is that the OEMs share their product plans with us out many years. We know where north is. North is a fully connected vehicle.”

According to company statements, SiriusXM provides connected vehicle services to eight OEM brands, with several others in the pipeline. On November 4, 2013, SiriusXM finalized its purchase of the connected vehicle services unit of Agero for $530 million in a cash transaction. Operating almost entirely in North America, the telematics services provider’s main customers are Acura, BMW, Honda, Hyundai, Infiniti, Lexus, Nissan, Rolls Royce and Toyota. Agero also provided services on behalf of BMW and Mercedes.

In mid-January 2014, just a couple of months following the ownership change, SiriusXM had integrated all of the roughly 500 former Agero employees, half of whom work at the call center. Also on board are 130 engineers, plus the account and business management teams. The unit is based in Irving, Texas.

The unit’s connected services include safety, security, convenience, remote diagnostics, routing and destination assistance, maintenance and data services delivered over two-way cellular networks. SiriusXM management targeted telematics for investment in the firm belief that eventually all vehicles will come with embedded modems, primarily because they provide OEMs a secure connection to the outside world that they can control.

The company expects Connected Vehicle Services will produce nearly $100 million in revenue in 2014. While the SiriusXM Connected Vehicle Services business will have its own P&L, it will not be run as a stand-alone business. It reports to Enrique Rodriguez, executive vice president of operations, responsible for all SiriusXM products. “We see this as a natural extension of our core business,” he said. “It will be run as an integrated part of the com-

Distinctions Claimed by SiriusXM

- The world’s largest radio broadcaster measured by revenue
- World’s number-one provider of in-vehicle subscription services
- The telematics service provider serving the most carmakers
- Satellite radios are installed in approximately 60 million vehicles, or 24% of the U.S. vehicle fleet.
- The world’s only telematics service provider to offer both cellular and satellite connectivity
SiriusXM Radio

SiriusXM Connected Services Customers

- Acura
- BMW
- Honda
- Hyundai
- Infiniti
- Lexus
- Nissan
- Rolls Royce

Company with little focus on its stand-alone P&L. Our focus will be on expanding the range of services that we bring to OEMs and consumers in the automotive space.”

SiriusXM serves the telematics market in the U.S. and Canada. All carmakers operating in the region are existing or potential customers with the exception of General Motors, which operates OnStar as a wholly owned subsidiary.

Competitors serving the merchant telematics market include Verizon, which acquired Hughes Telematics in 2012, and provides connected services to Mercedes and Volkswagen of America, and Sprint, which will soon provide telematics services to Chrysler customers.

Nissan

In a separate deal concluded in September 2012, well before its agreement to purchase the connected services unit of Agero, SiriusXM announced an agreement to provide telematics services to Nissan vehicles in North America. AT&T will provide the cellular connectivity.

Agero had been providing telematics services to Infiniti, the luxury division of Nissan. Now, following the acquisition, Nissan, Infiniti and SiriusXM are working on ways to consolidate Nissan’s and Infiniti’s telematics services.

Connected Vehicle Services—Synergies with Satellite Radio

- Infotainment and Telematics Are Merging

In the future the embedded modem will link not only to traditional safety and security services, but to infotainment services as well. That convergence of telematics and infotainment puts SiriusXM in a unique position. Well established in both the audio entertainment and data services (traffic flow information, weather and gas prices) businesses, it is the only telematics service provider with a significant infotainment business.

“The Agero connected vehicle business has done a great job with the user experience on the safety and security side,” said Mr. Rodriguez. “SiriusXM does a fantastic job of that with entertainment. Our number-one objective now is to deeply integrate those two user experiences.”

Along with satellite radio broadcast service, the company also offers SiriusXM Internet Radio, where a listener can personalize a channel or get on-demand content. “We see an opportunity to dramatically enhance the listening experience in the vehicle by combining the satellite content with the 4G LTE delivered content, which is more personalized,” said Mr. Cook.

- Automotive Relationships

SiriusXM already has strong relationships with every automotive OEM serving North America, as well as relationships with the tier-one suppliers who integrate SiriusXM satellite radio modules into head units. These relationships will be helpful as it further develops its telematics business.

- Engineering

The merger brings together the SiriusXM broadcast audio entertainment technology with telematics technology. “Agero has invested heavily in the back-end technology needed to process all the transactions going to and from the vehicle. That backend technology is complementary to the technology and the network that SiriusXM has developed,” said Mr. Rodriguez.

- Cellular Plus Satellite Connectivity

SiriusXM’s satellite connection only goes in one direction, downward to the vehicle; cellular networks are two-way, both to and from the vehicle. As it integrates its satellite services with telematics services, SiriusXM can make use of data exported from the vehicle via the cellular connection.

A number of telematics services would benefit from the availability of two independent wireless links to the vehicle. For example, remote door unlocking: “If a vehicle happened to be out of the range of cellular coverage, we could hit the car with a signal from the satellite,” said Mr. Cook.

SiriusXM’s satellite network could also be used to update vehicle software. “In most cases updates would be provided nationally, wherever the vehicle models happen to be located,” said Mr. Rodriguez. “That would be a great use of the satellite network’s ability to broadcast.”

- Consolidated Billing

Consumers who subscribe to both SiriusXM’s telematics and audio entertainment businesses will benefit from having just one company to contact and one bill to pay. Furthermore, customers who subscribe to one or the other service will be more receptive to promotions coming from a company they already do business with.

SiriusXM Connected Services Customers

Three-Year SIRI Share Price History

Source: BigCharts
of advertising revenue. Many other mobile Google products could be accessed while driving, such as news, location-based offers, calendar, Gmail and search, with much of it monetized.

Google’s online advertising revenues would be further enhanced by tracking where drivers go and what both drivers and passengers do online from their vehicles. The more Google knows about consumers, the more likely it will be able to target them with online advertising once they leave their vehicles. Vehicle data that tracks how people drive would help auto insurers find their best prospects. Google could monetize that.

All of this should motivate carmakers to try to make revenue-sharing deals with Google. There is already precedence for that kind of relationship. For example, Sirius XM Radio makes significant payments to carmakers to install and activate satellite radios, and AT&T will pay a $20 subsidy to OnStar for every new customer who signs up for the service.

**Auto Industry Wary**

Nevertheless, the auto industry is wary about where its relationships with Google and Apple might lead, as it should be. There is the matter of privacy. Laws are vague about who owns the data that a vehicle could send to the cloud. And there is plenty of concern about whether partnering with Google or Apple would be equitable. “Google has a long history of coming into a space and totally disrupting it for its own benefit,” warned Mr. Lawande.

“Once you give Google access to the car, they are masters of monetizing this and the carmakers could be left out,” warned Mr. O’Shea.

“The OEM engineers I talk to have a fear that they could be taken hostage. Google and Apple will not ask permission to change something, they will just do it,” warned Bosch SoftTec’s Kay Herget, head of marketing and product management.

Despite all the concern, carmakers should have the upper hand. Because they control the cockpit and they control the interfaces between any infotainment application and the vehicle networks, the OEMs will continue to call the shots.

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**Remote Software Updates Are Here**

**Red Bend Software Sees Auto Industry Adoption Soon**

It is a widely held view in our industry that in ten years or so, most cars will be capable of receiving software updates while they sit in the driveway. Infotainment systems will be the first to be remotely updated, and some years later cars will be capable of receiving updates to their vehicle control systems, even those that are critical to safety.

For Tesla, the future is here. Tesla is already doing what carmakers in the U.S., Germany, Japan and elsewhere are still planning. Tesla has already updated control systems on production vehicles in the field. In August 2013 Tesla remotely installed a “creep option” on its Model S electric vehicles, which lets drivers decide whether or not the car can begin to slowly move forward when the brake is released, which is similar to the way conventional vehicles equipped with automatic transmission work.

Tesla implemented another over-the-air software update in November, this one to give the Model S more ground clearance at highway speeds to “reduce the chances of underbody impact damage.” In December, Tesla made another over-the-air update to regulate the charging voltage to fix an issue that led to overheating in the charging system. In the next several weeks another update will deliver Version 6.0 of the Tesla software. That adds a feature to let drivers adjust the suspension's ride height mode, and provide for real-time traffic information, among other improvements.

Firmware over-the-air (FOTA) updates have become routine for mobile handset manufacturers to keep their devices fresh with the latest fixes, enhancements and features. “Handset makers started re-programming phones at the point of manufacture,” said Richard Kinder, vice president of technology and new business at the mobile software management firm Red Bend Software. “That slowly moved to the dealer or service point. Then once they were comfortable with that, it moved to full over-the-air updates. I see carmakers embracing a similar step-wise approach.” Since 2003, technology from Red Bend Software has been used to update more than 1.75 billion mobile devices, including those from the world’s top smartphone maker, Samsung.

Cars are next. Well aware that carmakers would eventually want to be able to update firmware over the air, Red Bend began investigating the automotive market in 2007, which proved too early. It looked again in 2010, and found automotive OEMs more receptive. “We won our first automotive production deal in 2010 with a U.S. [passenger vehicle] OEM. That hit the road in 2011 and 2012. We have other projects coming to market in 2015 and 2016,” said Mr. Kinder.

According to Red Bend, the European and American carmakers are all heading in this direction. “They see benefits from a customer satisfaction perspective and from a warranty cost management perspective,” Mr. Kinder noted. “Some carmakers are telling us they want to have the whole vehicle remotely updateable by 2020, every line of code.”

Thus far, all the car deals won by Red Bend involve the infotainment/telematics domain—the head unit, rear-seat entertainment, peripherals and eCall. Red Bend also expects to be involved with navigation map updates. But while it is possible to update applications separately from the rest of the infotainment system, “We think it’s really important to be able to update the whole head unit software holistically, because there often aren’t clear boundaries between the kernel, the middleware and the applications,” advised Mr. Kinder. Vehicles with that capability will be on the road beginning in 2015.

Commercial vehicle OEMs have been more aggressive than carmakers when it comes to updating vehicle control ECUs, those outside the infotainment domain, according to Mr. Kinder, “Because every minute a commercial vehicle is out of operation costs the operator money.” Production starts for systems that can update ECUs are expected in 2017. Red Bend’s Fuse product is designed for ECU updates.