Fiat to Make Blue&Me Standard

Microsoft Sets Deep Automotive Roots

According to Fiat, Microsoft has made real progress in its long and sometimes painful efforts to break into the auto electronics industry. Working with Microsoft on Blue & Me, a hands-free connectivity platform allowing drivers to safely operate mobile phones and media players by voice or with steering-wheel-mounted switches, Fiat achieved “quality we rarely found in the past for radios, navigation systems or other infotainment devices,” according to Fiat’s top electrical engineer, Gianpiero Oerto.

Intent on expanding its markets beyond the home, office and mobile phone environments into cars, Microsoft began working on automotive applications of its Windows CE operating system in 1995. It wasn’t a smooth transition. In early 1999, after a later-than-expected start, Clarion shipped the first Microsoft AutoPC to the aftermarket, but because sales were abysmally low, Clarion subsequently withdrew the product from the market. Later, in 2003, Bosch ran into so many problems with the launch of its new Windows CE-based navigation system that it had to hold up start-of-production of its new E-Class. The conventional wisdom at the time was that when it comes to the automotive environment, Microsoft just didn’t get it.

But Microsoft persisted. In 2003 it began working with Fiat on a reference design for a new infotainment system. Blue & Me is based on the Microsoft Auto PC (formerly called Windows Mobile for Automotive) software platform consisting of Windows CE and a number of application specific interfaces. It supports most Bluetooth mobile phones and provides spoken audio output of SMS messages.

Supercaps Show Promise in Automotive Applications

Some favorable news for supercapacitor developers came recently from BMW and Mercedes. Both have said that by 2010 or 2011 they will use supercapacitors, and not just on hybrid vehicles. Mercedes told The Hansen Report that the carmaker is likely to use supercaps to stabilize voltage during peak load conditions, to bridge the interval when not enough energy is coming from the alternator. Voltage stabilization is also on BMW’s agenda, as is using supercaps to power the stop-start function and to store recovered brake energy.

Unlike batteries, which provide energy for long periods of time, supercaps are sufficient when power is required for only a short period of time, less than 20 seconds, and are widely used in consumer electronics devices to protect data from being lost during short power outages.

A 23.3-farad, 12-volt package of supercapacitors measuring 170 mm by 150 mm by 70 mm is employed on the Toyota Prius as a power backup for the electronically controlled brakes. It is supplied by Panasonic EV Energy Co., a joint venture between Matsuhashi Group and Toyota, which owns 60%.

While Toyota does use supercaps in its Prius, a top electrical engineer from Toyota told us the company has no concrete plans to use them in non-hybrid vehicles. A top EE from Honda said that his company uses supercaps in fuel-cell vehicles under development, and currently has no plans to use them in either hybrids or conventional vehicles.

Maxwell Technologies in the Market

Valvo’s next-generation StA RS (starter alternator reversible system), which can accommodate regenerative braking, will make use of supercapacitors, most likely from Maxwell Technologies. Maxwell, based in San Diego, California, is already serving a number of commercial markets for supercaps. This past summer Valvo and Maxwell signed a memorandum of understanding covering a proposed multiyear development and supply agreement through which Valvo will source a multicell supercapacitor energy storage module from Maxwell. The Valvo starter alternator uses ten 2,000-farad supercapacitor cells per vehicle. Shipments could start in 2009, in time for the 2010 model year.

In September 2007, Maxwell Technologies announced that it had been awarded a contract by the Mercedes Car Group to design and produce supercapacitors for an advanced hybrid-electric drivetrain program incorporating a braking energy recuperation system. Maxwell said it has several other development projects in progress.

Supercapacitors: Features and Applications

Features
- Rapid recharging (seconds)
- Millions of charge-discharge cycles
- Deliver quick bursts of energy for up to 20 seconds
- Good cold temperature performance down to minus 40 degrees C
- Require no maintenance
- Made from nontoxic materials

Applications
- Voltage stabilization throughout the vehicle
- Provide battery augmentation for electric power steering, air conditioning and other peak current users at point of use to minimize wiring
- Recuperative brake energy storage
- Provide starter current for stop-start function
- Battery backup for electric brakes

Turn to Microsoft, page 3

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Mentor Graphics’ Tools Automate Wiring Harness Design

Twenty-first century automotive electronics innovation has consistently come by way of the Germans, and, to a lesser extent, the Japanese. Here is an American company with a product in the global market today that offers carmakers potential savings in vehicle cost, weight and engineering man hours, as well as increased electrical system reliability. Due largely to the success of its CHS (Capital Harness Systems) tool suite, Mentor Graphics’ Integrated Electrical Systems division is growing five times faster than the automotive electronics market, according to M. artin O’Brien, the division’s general manager.

Founded in 1981, Mentor Graphics, based in Wilsonville, Oregon, is publicly traded on the NASDAQ. With more than 4,000 employees, the company maintains 28 engineering facilities and 48 sales offices worldwide. Sales in 2006 were $791.6 million. Mentor Graphics is the world’s number-one supplier of printed circuit board design tools.

A long with increased complexity of vehicle electrical and electronics systems, whether a result of safety and environmental legislation or consumers’ desire for more versatile infotainment systems and connectivity, carmakers are offering a greater number of choices in options and variants within model lines and trim levels. According to Mentor Graphics, it is becoming very difficult for carmakers’ in-house IT departments to support a design tool flow that can efficiently handle that level of complexity in wiring harness design, and the OEMs are increasingly turning to outside tool vendors for help.

CHS

Mentor Graphics believes it provides a unique solution in its CHS tool suite. While traditional schematic tools have been widely used in wiring design for several years, they only show electrical connectivity, and it is left to the engineers to map the connectivity to specific wires and specific harnesses. Paul Duffy, Mentor Graphics’ principal technologist, noted, “Taking the logical schematics and creating wires from each of those connections is automated by the Mentor Graphics tool suite. No one else I am aware of automates that.”

A typical automobile may have as many as 70 logical systems. A radio, a lighting system or a BS, for example, each requires its own logical system. Mr. O’Brien explained, “An engineer designing a logical system for a radio, for instance, knows he needs power, ground, a signal that goes from the control unit to each speaker. He needs to take power from the battery. At that stage of design, you don’t consider how that logical system is going to be implemented in a vehicle.”

The physical implementation, including the size, length and type of wire, the routing, fusing, the location, size, type and number of connectors—is dependent on many factors and varies widely. “Only Mentor has the ability to take those logical systems, and, using a rule-based paradigm, simply allocate them en masse into the vehicle—physically allocate all the devices from the system, hook them up logically, and convert that to wiring, automatically,” he added.

OEMs and tier-one suppliers can use Mentor’s CHS tools not only to optimize the electrical architecture of a vehicle wiring harness and verify its performance, but also to keep track of running changes throughout the design cycle, including changes required to accommodate optional features that vary from model to model. Plus, CHS has the ability to capture a company’s specific in-house design practices as customized design rules, which ensures that the designs are correct from inception.

A cording to Mentor, since its launch in 2003, CHS has been warmly received at the OEMs, and even more so at the tier-one wiring harness suppliers worldwide. All the major wiring harness suppliers are using CHS to some degree. While at least five major carmakers are in the process of deploying CHS, Ford and Peugeot Citroën are two that have made public statements about their plans. Mentor describes CHS’s market position currently as in the early stage of mass adoption and the mature stage of launch.

Wiring Trends

Being on the front lines of electrical distribution system design, Mentor Graphics is well-positioned to observe what trends and changes are underway in wiring harness technology. M. O’Brien and M. Duffy mentioned these:

◆ Wiring harness manufacturing will remain labor intensive, although design data is already widely used to automate verification and final continuity checks. In the future, tools like CHS will facilitate data flow to cutting and marking equipment as well, increasing the focus on design for manufacture.

◆ Mentor sees continuing integration of electronics such as semiconductor-based fusing and more electronics content in junction boxes.

◆ Wireless communications only makes sense for the portable consumer devices.

The Hansen Report on Automotive Electronics

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THE HANSEN REPORT ON AUTOMOTIVE ELECTRONICS

Page 2, November 2007

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Today Blue&Me is installed on roughly 20% of all cars made under the Fiat, Lancia and AIFA brands, more than 300,000 units annually. That is just the beginning; over the next three years Fiat will make Blue&Me standard across all 1.8 million Fiat Group cars.

Gianpiero Oberto told us that before the Blue&Me project, he too had experienced quality problems with Microsoft. During the development of a navigation system from a European tier one, “We used to see a lot of blue screens due to Windows CE failures. But the quality figures have very much improved in the Blue&Me application. That is probably due to Microsoft’s increased automotive experience, and the fact that they devoted roughly 50 people to the development phase, a huge team.”

Mr. Oberto was impressed with the way Microsoft dealt with development problems. “They were very good with problem analysis and test methodology. Every time there was a malfunction, a new test model was born and added to the list. Once a problem was solved, we were assured that it would never happen again.”

According to Giovanni Maria Varazi, in charge of product strategy for the Fiat Group, while safety and ease of use are important to consumers, price is the main reason why Blue&Me is an unqualified success. It is offered standard on the official launch of the Cinquecento.

By year-end 2007, Fiat will begin producing Blue&Me Map, a portable navigation device that wirelessly links to the embedded Blue&Me connectivity platform by means of Bluetooth. Microsoft Auto platform. According to Fiat, Blue&Me will make Blue&Me standard across all 1.8 million Fiat Group cars within three years.

Microsoft in Worldwide Navigation Markets

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<tr>
<td>OEM Sales (thousands of units)</td>
<td>5,665</td>
<td>6,650</td>
<td>7,585</td>
<td>8,634</td>
<td>9,826</td>
</tr>
<tr>
<td>Microsoft Market Share (%)</td>
<td>5.3</td>
<td>10.2</td>
<td>14.1</td>
<td>18.8</td>
<td>23.8</td>
</tr>
<tr>
<td>Navigation Sales with Windows OS (thousands of units)</td>
<td>298</td>
<td>677</td>
<td>1,073</td>
<td>1,626</td>
<td>2,342</td>
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<tbody>
<tr>
<td>PND Sales (thousands of units)</td>
<td>2,150</td>
<td>5,665</td>
<td>13,110</td>
<td>25,165</td>
<td>33,345</td>
</tr>
<tr>
<td>Microsoft Market Share (%)</td>
<td>17.9</td>
<td>19.3</td>
<td>26.0</td>
<td>31.6</td>
<td>34.6</td>
</tr>
<tr>
<td>PND Sales with Microsoft OS (thousands of units)</td>
<td>385</td>
<td>1,095</td>
<td>3,415</td>
<td>7,940</td>
<td>11,530</td>
</tr>
</tbody>
</table>

The affordability of the platform is especially apparent with Fiat’s latest navigation offering. Newly available on the Fiat Bravo and Croma, the AIFA Romeo 159, Brera and Spider, Blue&Me nav retains for just 499 euros. That’s an attractive price for all the Blue&Me hands-free connectivity features plus navigation. And since Blue&Me nav comes with an embedded cell phone, users can opt for a variety of telematics services: SOS Emergency, Info Services and Insurance Services, which offers premium discounts up to 50% based on how the customer actually drives. Fiat expects Blue&Me nav to be optioned in 10% of the vehicles where it is offered.

While Microsoft has a lock on Blue&Me, and Fiat is very pleased with the relationship, Fiat is not necessarily wedded to the software platform for its next-generation, high-end, low-volume, integrated navigation system due around 2010. Potential suppliers include Magneti Marelli, which makes the Blue&Me hardware, Bose, Siemens VDO (now Continental) and Harman Becker, among others.

Microsoft Automotive Device Partners

- Alpine
- Clarion
- Continental
- JVC
- Mitsubishi Electric
- Panasonic
- Pioneer
- Siemens VDO

*According to the carmaker, 50% of all the 2008 model year vehicles sold in North America will come with the Ford Sync portable device connectivity feature, which is based on the Microsoft Auto software platform.

**About 20% of all Fiat Group vehicles are sold with the Blue&Me connectivity feature, which is based on the Microsoft Auto platform. According to Fiat, Blue&Me will become standard equipment across all Fiat Group vehicles within three years.
The Company Profile... Nuance Communications

Background

The evolution of voice recognition technology in automotive applications has been a painfully slow process, taking more than a decade to move significantly beyond simple command and control functions and automatic dialing. The main catalysts for speech in the vehicle are phone kits, navigation equipment and MP3 players, which are nearly impossible for a driver to operate safely using only keypads and displays. One company poised to profit from the widespread adoption of voice recognition in cars is Nuance Communications.

The company that became Nuance was incorporated in 1992 under the name Visioneer Inc. Visioneer acquired ScanSoft, a scanner hardware and software company, from Xerox Corp. in 1999. Visioneer then changed its corporate name to ScanSoft Inc. In 2001 ScanSoft bought the speech and language technologies business of the bankrupt Lernout & Hauspie for $39.5 million. ScanSoft acquired Nuance Communications, which owned call center automation and directory assistance speech technologies, in 2005, and adopted the Nuance Communications name that same year.

Nuance owns more than 380 speech technology patents with an additional 270 patents pending. Corporate headquarters are in Burlington, Massachusetts, near Boston; European headquarters are in Ghent, Belgium; Asian headquarters are in Tokyo.

Visioneer then changed its corporate name to ScanSoft Inc. In 2001 ScanSoft bought the speech and language technologies business of the bankrupt Lernout & Hauspie for $39.5 million. ScanSoft acquired Nuance Communications, which owned call center automation and directory assistance speech technologies, in 2005, and adopted the Nuance Communications name that same year.

Nuance owns more than 380 speech technology patents with an additional 270 patents pending. Corporate headquarters are in Burlington, Massachusetts, near Boston; European headquarters are in Ghent, Belgium; Asian headquarters are in Tokyo.

The early automotive speech systems introduced in the mid-1990s in embedded navigation systems in Japanese vehicles were not only very expensive, but they did not work very well in the car’s noisy environment. Customers found them frustrating to use.

According to Craig Peddie, vice president for Nuance’s Embedded Speech Solutions business, speech recognition was hyped before it was really ready, and that sullied the technology, making carmakers reluctant to use it in their vehicles. Now, finally, speech technology is mature enough for automotive applications, he believes. “The most obvious evidence of the technology’s maturity is that you are now starting to see it on more and more car models and on personal navigation devices. Speech recognition as part of the overall human machine interface is now promoted more than ever by the car industry to increase driver safety and usability of infotainment solutions. There are even carmakers like Ford that advertise...
speech recognition as a differentiating feature of their cars, for example, the Ford Fiesta campaign in Europe.”

Mr. Peddie is responsible for Nuance speech applications in the mobile, automotive and consumer electronics markets. Prior to Nuance, Mr. Peddie was vice president and general manager of Tegic Communications, a provider of predictive text input software. Before that he was general manager of Motorola's Lexicus division, focused on the development and licensing of user-interface technology, including embedded speech recognition applications.

“Only in the last two years have the use cases been compelling enough and the technology mature enough for speech to take off in the automotive environment,” explained Mr. Peddie. “We've got it to where we can now accurately recognize a few hundred thousand street names for voice destination entry in navigation systems. Our European systems are now getting multilingual—you can speak an English song title in a German entertainment system and the system will understand. Text-to-speech now sounds natural, not like a robot. And we have continually worked on noise robustness.”

At the same time, cars have gotten quieter, and the electronics hardware has become much more affordable. According to Mr. Peddie, hands-free car kits are now capable of running low-end speech recognition systems adequate for command and recognition of several hundred address book entries. A 100-MHz, 32-bit CPU

**Speech software from Nuance is embedded in vehicles manufactured by these carmakers:**

- Acura
- Alfa Romeo
- BMW
- Cadillac
- Chrysler
- Citroën
- Fiat
- Ford
- GM
- Jaguar
- Land Rover
- Opel
- Mercedes-Benz
- Nissan
- Peugeot
- Renault
- Saab
- Volkswagen

**Nuance Mobile Solutions** Sales

![Sales Graph]

*Automotive customers, including makers of personal navigation devices, account for roughly half of sales.

**Speech software has been ported to devices made by these semiconductor manufacturers:**

- Analog Devices (Blackfin)
- Freescale
- Intel
- NEC
- Renesas
- Texas Instruments

with 2 MBytes of RAM today is standard hardware platform for car kits. Not too long ago that was considered a high-end hardware platform found only in the most expensive car kits and head units. On the navigation side, for full-blown voice destination entry systems, the minimum hardware configuration is a 200-MHz, 32-bit CPU and upwards of 7-10 Mbytes of RAM. These systems are already available in the market. As the price of hardware declines further, the number of speech applications will rise. While an operating system is a basic requirement, by design Nuance avoided any dependency on expensive OS software.

**A utomotive Speech Business**

The bulk of Nuance's roughly $20 million in automotive revenue comes from three products: ViaVoice on speech recognition software, and Realspeak and Vocalizer text-to-speech (TTS) software. Professional services—selecting the appropriate technology, integrating it to the customers' platform requirements and refining the user experience—account for approximately 15% of the company's automotive sales. Nuance's speech products bring in license revenues according to the number of units in which they are installed.

**Nuance speech software has been used as a component in products produced by these suppliers:**

- Alpine
- Bosch-Blaupunkt
- Clarion
- Cullmann
- Delphi
- Denso
- Harman
- Microsoft
- Motorola
- NEC
- PEiker Acoustic
- Pioneer
- Siemens VDO
- Sony
- TomTom
- Visteon
- Visteon
- Xanavi

**Acquisitions**

Among Nuance's many acquisitions of speech recognition and text-to-speech technology, these four formed the basis of the Nuance products used in automotive applications:

- 2001 Lernout & Hauspie (RealSpeak)
- 2003 Philips Electronics Speech Processing and Voice Control business units (VoCon)
- 2003 SpeechWorks International (Speech recognition, text-to-speech and speaker verification)
- 2004 Advance Recognition Technology (Speech interface for handsets)

Europe and Asia, where penetration of high-end navigation is strongest, account for the bulk of automotive sales. Nuance's automotive solutions have been deployed in 15 countries. For embedded applications, Nuance offers speech recognition products in more than 20 languages and text-to-speech in 30 languages.

Nuance's competitive landscape varies somewhat from region to region. For Japanese-language applications, A sahi is the main competition. A sahi also supports English and European languages, but those have not been as widely deployed as Nuance's solutions. Nuance is Denso's primary supplier of non-Japanese speech software, especially in Europe. For the Japanese language, Denso uses an internal speech recognition solution.

In the United States, the main competition comes from IBM's Embedded ViaVoice product line. IBM also competes...
Nuance Communications

in the European market, as does Temec Speech Dialog Systems, which Harman bought from DaimlerChrysler in 2002. Nuance has a couple of programs in development that will use its Chinese language recognition and text-to-speech products, but those have not yet been deployed.

We asked Mr. Peddie why Nuance’s automotive customers choose to do business with Nuance rather than with its competitors. “We have been in the automotive business since 2000. We have a dedicated 65-engineer product team that works exclusively for automotive customers on automotive applications. We have the broadest language portfolio of any supplier in the auto industry, for both recognition and text-to-speech. And since we operate in all three domains—the car, the handset and connected services—we are the only company that can handle the integration of those domains that will occur in the future.” Nuance speech software is already embedded in more than 10 million cars and 100 million handsets, the latter a market that is growing much more quickly than the automotive market.

Ultimately, according to Mr. Peddie, speech software will come embedded not only in most vehicles, but also in most cell phones. “When you sit in your automobile with your Bluetooth phone, the automobile and the telephone will communicate with each other, understand who has what capabilities, synchronize address books, perhaps synchronize M P3 files. While you’re driving, you will be using the speech engine in the car, because it will have the better microphones.”

“There will be server-based engines as well, for providing location-based services to the vehicle. You’ll say, ‘Give me the Starbucks closest to my location.’ The recognition will actually be taking place on a server somewhere that will be downloading Starbucks locations to the map displayed on the big and bright LCD in your car’s head unit,” Mr. Peddie said. In 2008, according to Nuance, more than 100 million new phones will come with speech software of some sort.

Nuance speech engines are used in two high-profile, speech-activated, in-car communications and entertainment systems applications. Fiat Blue& Me was launched in 2006; Ford Sync debuted in the fall of 2007. Both systems are based on the Microsoft Auto platform.

Nuance speech software interfaces with content from Tele Atlas.

Nuance has a couple of programs in development that will use its Chinese language recognition engine is already used for voice-enabled navigation in the new Mercedes C-Class and will be included in systems destined for E-Class updates. Nuance had been supporting voice destination entry for systems introduced by Xanavi for the Nissan Infiniti in 2004, but no longer has that business.

Speech is especially well suited to personal navigation devices, which are limited by small screens and minimal input capabilities. Since July 2007, Nuance-enabled voice destination entry has been featured on the TomTom GO product family. TomTom is Europe’s number-one PND supplier. Other PND makers using Nuance for destination entry include MiTAC and Magellan.

A retail price pressures increase, and as speech technology improves and hardware costs come down, Nuance expects that TTS and VDE will become part of

### Distinctions Claimed by Nuance

- The world’s most comprehensive product line of speech solutions
- Largest and most experienced speech company in the world
- The first vendor to support recognition of names from a list of over 300,000 entries
- Nuance’s VoCon family is the world’s most widely deployed embedded speech-recognition engine

### Speech and Personal Navigation Devices

<table>
<thead>
<tr>
<th>PND Feature</th>
<th>Value Add Features from Using Speech</th>
<th>Nuance Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP3 playing</td>
<td>Select song or album by voice Control the MP3 player by voice Playback title or other song information</td>
<td>MP3 SpeechPAK application module tailored for speech-enabled song control, including TTS for audio feedback</td>
</tr>
<tr>
<td>Traffic information</td>
<td>Playback of traffic updates to allow the driver to re-adjust route</td>
<td>Text reader using RealSpeak Solo</td>
</tr>
<tr>
<td>Phoning</td>
<td>Hands-free, voice-activated dialing Playing back of SMS messages</td>
<td>SpeechPAK VAD application module for voice-activated dialing</td>
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<td></td>
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<td>SMS reader, including SMS pre-processor</td>
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<tr>
<td>Language guide</td>
<td>Play back words or sentences in foreign languages Enter a common phrase and spoken output of the translation</td>
<td>Recognition of generic sentences using VoCon 3200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Audio playback using RealSpeak Solo</td>
</tr>
<tr>
<td>Travel guide</td>
<td>Information about points of interest can be spoken back Select particular restaurant/hotel by voice</td>
<td>Audio playback using RealSpeak Solo</td>
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<tr>
<td></td>
<td></td>
<td>Selection of points of interest by voice using VoCon 3200 recognizer</td>
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Speech and Naviagation Go Hand and in H and

The market for navigation equipment, both embedded and portable, is the primary market driver for speech software in cars today—voice destination entry (VDE) and text-to-speech for the resulting directions.

“Until the advent of navigation systems, there was really very little speech in cars; it was strictly speech recognition for command and control and voice-activated dialing,” said Mr. Peddie. “Text-to-speech came along with turn-by-turn navigation. Now, if a tier one or OEM is going to integrate any type of speech into their vehicle, it is for navigation and command and control.”

Destination entry represents the state of the art of automotive speech recognition, and Nuance’s destination entry is finding widespread acceptance. At least eight applications are already shipping; 10 to 20 more are in the works and will start shipping in the next 12 months. A major supplier to both market segments, Nuance’s navigation business is split evenly between embedded navigation and portable navigation devices (PNDs).

Embedded in navigation units built by Mitsubishi Electric, Nuance’s speech-recognition engine is already used for voice destination entry in the new Mercedes C-Class and will be included in systems destined for E-Class updates. Nuance had been supporting voice destination entry for systems introduced by Xanavi for the Nissan Infiniti in 2004, but no longer has that business.

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A retail price pressures increase, and as speech technology improves and hardware costs come down, Nuance expects that TTS and VDE will become part of
Drivers don’t have to remember a long list of commands and a rigid set of dialogs. “It lessens the cognitive load,” said Mr. Peddie. “Drivers can have a conversation with their car. They can say, ‘Gee, I want to listen to classical music.’ It could understand that (a) you’re talking about the radio, and (b) you want classical music.” In an XM Radio-equipped car, it would ask, ‘Do you want to listen to XM Classics?’ You say, ‘Yes,’ and it will tune the radio for you. ‘Or you could say, ‘I want to go to 123 Main Street.’ It would look it up and respond something like, ‘I have four 123 Main Streets, which city would you like to go to?’ After speaking the name of the city, the navigation unit develops the route guidance for you,” he explained.

Nuance will start delivering elements of its new natural language processor packaged with speech recognition software in 2008, in time for market introductions in the 2010 model year. Carmakers in the United States are especially interested in natural language software.

With natural language processing, the output of the speech engine is handed over to a robust parser that extracts the semantic meaning of what is said, based on statistical probability. Nuance has already deployed natural language systems in server-based applications, as well as in dictation products like Dragon NaturallySpeaking.

In the next couple of years, said Mr. Peddie, natural language understanding will lead to another wave of automotive speech applications. “You have satellite radio with over a hundred channels, CD players, iPods, MP3s—speech is the only way to do it.”

With this product Nuance will soon find itself competing against VoiceBox Technologies, whose natural language software is coupled with speech engines from either Nuance or IBM.

**Text-to-Speech**

Nuance offers two types of speech output products. Its RealSpeak product line is concatenative, meaning that words are built by linking small units of actual recorded human speech. Nuance’s Vocalizer product line employs a different type of speech synthesis in which the output is created from a parametric model. “With Vocalizer the TTS engine is much smaller, because you don’t have to store all the real speech inventory, but it isn’t as natural sounding as RealSpeak,” said Mr. Peddie.

“In automotive applications, where the head unit is built into the car and often features a hard disk drive with lots of memory, RealSpeak is the TTS product of choice, because you can get the most natural sounding voices. However, for low-cost PND applications, customers are going with our latest version of Vocalizer, called Vocalizer for Mobile. It sounds better than our small version of RealSpeak, but takes up a small fraction of the memory, on the order of 1.5 MB for a full system,” Mr. Peddie explained. With Vocalizer for Mobile, developers are provided with the flexibility to modify the speaking rate, pitch and voice characteristics of the output voice. A long with turn-by-turn navigation instructions, applications include reading SMS text messages and email. New releases coming out now can combine prerecorded phrases (for example, “in 300 meters, turn right”) with Vocalizer TTS.

**VoCon on Speech Recognition**

Designed for automotive, mobile and other embedded applications, VoCon on 3200 is Nuance’s latest-generation speech recognition engine. In addition to speaker-independent continuous digit and command recognition, it supports text enrollment of address books to allow speaker-independent name dialing with no training required. Further, VoCon on 3200 supports street and city name recognition, even of large countries like the United States or European-wide navigation systems.

“For command and control and the address book with 1,000 or more names, recognition accuracy is 95%,” said Mr. Peddie. “The accuracy goes up to 98% or 99% for digits and menu commands. For destination entry, if you have a couple-hundred thousand street names, then accuracy goes down to 80% but that means four out of five entries will be recognized correctly. But then, any name not recognized can easily be spelled using our Smart Spelling module.”
Supercaps...

contracts with automakers involving supercaps.

“We do a lot of business with automotive customers in Europe. In addition to our relationships with Valeo and Mercedes, there are others we are not at liberty to disclose,” said Michael Sund, vice president of communications and investor relations for Maxwell Technologies. “We have provided samples and conducted collaborative development with at least a dozen automakers.”

“I can make a case for using a number of boost cap (supercapacitor) packs throughout the vehicle to complement the battery,” said David Schramm, CEO of Maxwell Technologies. “Why not put boost caps everywhere that power is needed—the air conditioner, electric power steering, the starter—to minimize the need for big, heavy, inflexible and expensive cables.”

Carmakers who package the battery in the trunk must run a power cable the length of the vehicle. Downsizing that cable might provide sufficient savings to pay for the supercap. “I think packaging

Hella’s FY 2007 Sales Up 8%

Hella KGaA Hueck & Co.

Fiscal year 2007 ended May 31, 2007

Provisional figures

FY 2007 Sales: €3.7 billion

Change from FY 2006: up 8%

FY 2007 Earnings Before Interest and Taxes: €46 million, or 1.2% of sales, compared with €18.5 million in the prior year

Company’s Outlook: Grow sales to €6 billion in the medium term, without acquisitions

While Hella’s largest business division remains lighting, the electronics and aftermarket segments each produced more than €1 billion in sales in the last fiscal year. More than 80% of Hella sales are to European customers. The electronics business division has been growing steadily during the last three fiscal years at an average rate of 8.5% per year, somewhat faster than the market. Electronics accounted for 32.4% of Hella’s sales in FY 2007.

Hella provides the Audi Side Assist lane change warning system in the 2007 Q7. The system uses two 24 GHz radar sensors in the vehicle’s bumper, one on each side. Other Hella driver assist systems already on production vehicles include rear-view cameras, adaptive headlights on the BMW 5 Series, and on the MY 2007 Chrysler 300C, a lidar-based adaptive cruise control system. Hella has booked business with a European carmaker for an automatic parking system, with production scheduled to start in 2009.

During the last fiscal year, Hella made some notable strategic alliances and acquisitions as it expands its product portfolio beyond lighting. Hella joined with Volkswagen, EB (Elektrobit) and NEC Electronics Europe to develop an Autosar-compliant body electronics control unit. Hella was responsible for the ECU hardware, software and software integration.

In May 2007, Hella announced a strategic alliance with the Chinese carmaker Geely, for body electronics. Hella also acquired a German developer of sensor and body electronics hardware and software, Enko Automotive, in March 2007.

Possible Major Automotive Supercapacitor Suppliers

batScap
Capxx
Maxwell Technologies
NessCap
Panasonic EV Energy Company

Continued from page 2

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