Big Data Benefits for Carmakers in the Distant Future

At $18.6 billion the global IT market for big data is already huge and growing fast, rising annually by 28.1% from 2013 through 2017, according to the Wikibon Project. Thus far, some of the biggest beneficiaries of the big data market are the mega-IT vendors such as IBM, HP, Dell, SAP, Oracle and Cisco Systems, companies that provide the services and produce the hardware and software used to wrest value from big data. One needs to look no further than Google to see the vast potential to create enormous wealth from great quantities of data, but while carmakers are definitely interested and are actively exploring how best to proceed, they are not yet big customers.

Wikibon defines big data as “those data sets whose size, type and speed-of-creation make them impractical to process and analyze with traditional database technologies and related tools in a cost- or time-effective way.”

Carmakers have access to and could collect vast quantities of data from which insights could be drawn, services rendered, and value created. But what are the best use cases for automotive big data? What value does each use case deliver and at what cost?

Amidst plenty of hype from the IT companies and others about the value of big data, the market research firm SBD recently published a report, Automotive Big Data, What's It Really Worth?, and came up with some numbers that it thinks are realistic: $130 total value per car, per year, based on 15 use cases.

“We are seeing some fairly wild claims about the value of automotive big data; the industry needed some harder facts,” said Lee Colman, one of the study’s authors. The study’s top three use cases ranked in order of value are: usage-based insurance, customer relationship management and lower warranty expenses.

Kevin Link, senior vice president of Verizon Telematics, agrees that diagnostics and warranty management will be among the leading big data use cases. “OEMs can use that data to drive costs down dramatically by being proactive, fixing problems before they become major issues. … Verizon is making big investments in big data. We have a team in Palo Alto with about 50 people, and we are hiring people left and right.”

Still, many sizeable obstacles stand in the way of big payoffs from big data. For best results, cars should be connected to a 4G cellular network by means of an embedded modem so data can flow freely to and from the vehicle. By 2018, according to SBD, 70% of cars sold in Western Europe will have embedded connectivity, largely due to the eCall mandate. In the U.S. 40% of new cars will be connected by 2018.

Even by 2018, however, much of that connectivity won’t be 4G. According to IHS Automotive, of the 45 million new vehicles worldwide that will come equipped with embedded telematics in 2018, just 31% of them will have LTE or 4G connectivity. Even a 4G data pipe will have its limits: “At the end of the day, someone has to pay the phone bill for the data,” pointed out Tim Nixon, chief tech-

Automotive Big Data Use Cases

- Usage-based insurance
- Cloud-based maps for self-driving vehicles
- Recognize customer/market trends
- Improved product planning
- Text analysis of online forums
- Remote diagnostics and prognostics
- Faster fixes of quality and safety problems
- Over the air software updates
- Driver HMI usage pattern analysis
- Location/usage-based ad targeting
- Customer relationship management
- Crowd-sourced traffic information
- Crowd-sourced safety warnings
- Parking directions/reservations
Big Data...

continued from page 1

Cisco Systems’ "answer," said Andreas Mai, director of Smart Connected Vehicles for Cisco Systems. “Not so. The speeds are faster, yes, but they are not fast enough to support all of the big data use cases.”

Data could be sent via Wi-Fi when the vehicle has access to a hot spot at home or elsewhere, “But people tend to forget that the 3G or 4G or Wi-Fi link is only the last mile,” cautioned Mr. Mai. “Carmakers will also need to improve and scale up their backend infrastructure. Rather than pumping the data all the way up to the cloud and processing it there, we offer products that put some computing at the edge of the cellular network to filter relevant data from irrelevant.”

Car’s Onboard Systems Must Change

Once carmakers decide which use cases to pursue and which data need to be sent to the cloud, they can begin to explore how the vehicle’s architecture needs to be changed to accommodate collecting, storing and sending that data. More onboard memory will be needed, especially for cars without embedded modems that must rely on a brought-in smartphone or Wi-Fi hotspot.

Michael Natusch heads the data science team at Pivotal Software, a Palo Alto-based software and data services start up. In his view, more computing power will need to reside on the vehicle. “Regardless of 4G’s bandwidth limitation, it’s financially prohibitive to send back more information than you absolutely need. There has to be intelligence in the car that decides what data to store onboard, what can be discarded and what needs to be sent back,” he said.

Rather than investing in huge data centers with lots of dedicated memory, Pivotal created software that lets its customers use flexible resources in the cloud to store and process vast sets of data. One of Pivotal’s customers is collecting and analyzing data from a fleet of 500 vehicles almost in real time. “You have the car data and GPS data, so you know where the car is,” said Mr. Natusch. “And then you bring in all sorts of external data such as weather, and you can build a picture that is holistic. You can learn how real people use cars in the real world.”

Changing the vehicle’s architecture to accommodate big data won’t be easy. “We’ve got to find a way to aggregate and process the information that needs to be sent without breaking the bank,” said GM’s Mr. Nixon. “Given the tight competitive space we are in, we are not going to add tens of dollars to a car to do this. That won’t be tolerated by anyone.”

Privacy

Another challenge to consider is privacy, which has become a hot-button issue in the wake of Edward Snowden’s revelations about U.S. spying. In its push for progress on data protection reforms, the European Union reported that nine out of 10 Europeans say they are concerned about mobile apps collecting their data without their consent. Seven out of 10 are concerned about how companies might use the information they collect.

Carmakers will have to take a hard look at the privacy concerns and consider how to accommodate them. They will be well served by making it clear to customers what data they are collecting and for what purpose. “Customers will probably agree to let OEMs collect information, provided they get something out of it,” suggested Raj Paul, who manages the M2M solutions team at CW Professional Services.

“And anyway, people complain about Google collecting all kinds of data, but they still use their Android devices.”

OnStar

A necessary first step into big vehicle data is 3G or preferably 4G connectivity. Founded 18 years ago, now with more than 6.6 million active subscribers worldwide, GM OnStar has more connected vehicles on the road than any other carmaker, by far. This year GM will begin the transition from 2G to 4G, well ahead of other carmakers. GM is also farthest along in its adoption of one of big data’s best use cases, vehicle diagnostics. OnStar collects about 13 kilobytes of data per month from each connected vehicle for its diagnostics emails. While the amount of data sent today is very small and therefore doesn’t require the use of data warehouses and big data analytics, it does suggest that GM is very well positioned to eventually wring value from big data products and services. “We are in...
Mini Profile: Lochbridge

Lochbridge was formerly the Professional Services division of Compuware and held the interim name CW Professional Services from February to June 2014. 

**Headquarters:** Detroit, Michigan; www.lochbridge.com

**2013 Revenue:** $135 million

**Products:** Information technology services for mainframe, distributed and mobile environments

**Key Markets Served:** Transportation, food and manufacturing

**Automotive Expertise:** Its telematics solutions have connected more than 20 million vehicles

**Automotive Customers:** The business is presently working with two of the Detroit Three and four non-domestic OEMs on connected vehicle and telematics programs.

**Automotive Employees:** More than 350

**Specialties:** Enterprise mobility, enabling the Internet of Things, business analytics and the connected car

**Ownership:** The Compuware division was recently purchased by Marlin Equity Partners, an investment firm.

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**Professional Services* Revenue by Year ($ millions)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>142.8</td>
</tr>
<tr>
<td>2011</td>
<td>151.5</td>
</tr>
<tr>
<td>2012</td>
<td>134.7</td>
</tr>
</tbody>
</table>

*As a division of Compuware Corp. before the acquisition by Marlin Equity Partners

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Although Lochbridge does not disclose its customers, OnStar’s chief technical officer, Tim Nixon, was more forthcoming: “We have used Lochbridge, and they offer what I would call a unique set of talent, different from traditional automotive talent... What I see with a company like that is a way to go get access to that talent in this new world order. They are software people; they are thinking about the connected world but coming from a different angle. They come from a company that is generally IT-based, but they are not just traditional IT. They blend themselves into the world of apps, and because they are here in Detroit they have an automotive slant to what they do. I think they have some unique opportunity ahead of them.”

Approximately 350 Lochbridge employees are devoted to telematics and infotainment, mainly developers and architects doing applications and IT back office development. Largely a J2EE (Java 2 Platform Enterprise Edition) technology shop, it also writes Java Script and HTML software. Roughly 25% of Lochbridge employees are devoted to the automotive market.

Fees for development services are paid according to fixed-price contracts, or the company is paid an hourly or daily rate for its professional services.

**What’s Next for Telematics?**

“Leveraging the 4G pipe,” said Raj Paul, director of sales and delivery, M2M solutions for Lochbridge. Mr. Paul, who has architected telematics and infotainment systems for carmakers, said, “Wireless bandwidth has continually evolved, but the capability to leverage the bandwidth didn’t exist until iPhones came along. The iPhone revolutionized the smartphone industry. Now carmakers want to make their connected infotainment system as revolutionary as the iPhone. They want a head unit that can run multiple applications. They want a 4G Wi-Fi hot spot. They want a user interface that’s so rich that drivers won’t want to use their smartphones while driving. The head unit is right in front of the driver’s face; it should be leveraged to retain customers and differentiate the carmaker’s brand. The 4G pipe could provide the OEMs new revenue-generating opportunities as well.”

Vijitha Chekuri, program director responsible for delivery and operations, M2M solutions, sees demand for 4G services on the consumer side as well: “Car customers look at the Internet availability in the car and then look at their mobile phones and ask, ‘why can’t the car do what my phone does?’ It’s not a totally fair comparison, because you can’t cram too many features and functions into the vehicle without distracting the driver. But they want the same experience, a seamless experience.”

**Lochbridge’s Future**

According to an interview with David McGovern, managing partner of Marlin Equity Partners, published in January 2013 by Argyle Executive Forum, his investment firm looks for businesses it can grow and improve through operations. “Ultimately our job is to drive returns for our investors, so we focus on businesses across a number of industries where we see opportunities to create value.”

According to the interview, Marlin Equity Partners is not a leveraged buyout firm. “We are generally low users of leverage. We want to give businesses a chance to succeed without being tied down with significant cash flow drains at the outset. It’s all about making sure the business has enough free cash flow to get stabilized after the extraction has been completed.”

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**Background**

The Professional Services segment of Compuware Corporation, with $135 million in revenue in 2013, along with two other Compuware software divisions Changepoint ($40 million in 2013 revenues) and Uniface ($46 million), was sold to Marlin Equity Partners on January 31, 2014, for $160 million, less a $23 million allowance for liabilities. The name Lochbridge was announced in June 2014.

Working behind the scenes, Lochbridge is not a well-recognized brand in telematics circles, despite its 15 years of experience supporting telematics service providers with machine-to-machine expertise, architecture development and systems integration work. It is not permitted to give the names of its connected-vehicle customers, which include two of the Detroit Three, a few non-domestic carmakers and several tier-one suppliers. The company’s headquarters are located one block away from GM’s headquarters in Detroit.
Desay SV Automotive

The Company Profile...

Background

Many months ago I asked a top electrical engineer from PSA Citroën if he was aware of any Chinese companies likely to emerge from China to serve the global automotive electronics market. His recommendation: Desay SV Automotive. The company’s main products are automotive displays, radios, navigation and climate controls, which today it supplies primarily to Chinese OEMs and the aftermarket. But Desay wants the global auto industry to know that it is not a typical low-cost, no-technology, low-quality, Chinese company. According to management, there is little interference from the state in the company’s day-to-day operations.

The company was founded in 1986 as Car Audio Electronics Co., a joint venture between Philips Car Systems, HK Gold Peak Industries (Hong Kong) and Huizhou Industrial Development Corporation, which changed its name to Desay Corporation in 1992. In 1998, Philips Car Systems was acquired by Mannesmann VDO, at the time a German tier-one supplier of cockpit modules, instrument clusters and control systems. In 1999, Mannesmann VDO bought out Gold Peak’s shares in the Car Audio Systems joint venture. Siemens

In this complicated ownership structure, roughly half of the parent, Desay Industry Development Co., Ltd., is owned by the city government of Huizhou, China. According to management, there is little interference from the state in the company’s day-to-day operations.

CL (Choon Lim) Tan is chairman and CEO of Desay SV Automotive. Born in Malaysia, Mr. Tan was educated in Canada and started his career in 1984, working as an engineer for Philips in Singapore. After jobs in production and purchasing, in 1998 Mr. Tan became plant manager of the manufacturing plant he presently runs in Huizhou. In 1998 the plant was owned by the original three-party joint venture of Siemens VDO and Desay Corporation. The following year the joint venture was renamed Siemens VDO Automotive (Huizhou). Five years later, in 2007 Siemens VDO was acquired by Continental. Desay Corporation bought out Continental’s 70% share of the joint venture in 2010, creating the division of Desay we are profiling, Desay SV Automotive. The “SV” in the name ties the company to its German roots via Siemens VDO.

In this complicated ownership structure, roughly half of the parent, Desay Industry Development Co., Ltd., is owned by the city government of Huizhou, China. According to management, there is little interference from the state in the company’s day-to-day operations.

CL (Choon Lim) Tan is chairman and CEO of Desay SV Automotive. Born in Malaysia, Mr. Tan was educated in Canada and started his career in 1984, working as an engineer for Philips in Singapore. After jobs in production and purchasing, in 1998 Mr. Tan became plant manager of the manufacturing plant he presently runs in Huizhou. In 1998 the plant was owned by the original three-party joint venture of Philips Car Systems, Gold Peak and Huizhou Industrial Development Corporation. During his tenure as plant manager from 1998 to 2004 sales grew from 200 million RMB to 1 billion RMB. Mr. Tan left the joint venture in 2005 for a stint at Siemens VDO’s Asia Pacific headquarters in Shanghai, where he was COO for China. Mr. Tan rejoined what is now Desay SV Automotive in 2008.

Azmoon Ahmad is managing director of Desay SV Automotive in Singapore, where he directs international business development. Born in Malaysia and raised and educated in Singapore, Mr. Ahmad is an electronics engineer who has been designing radios and automotive electronics since 1986, first for Philips Car Systems and later for the progression of acquirers of that business, ending with Continental. Mr. Ahmad spent several years working in Europe before returning to Singapore to run his own small R&D company. He was persuaded to join Desay SV Automotive in 2012 by his friend of 28 years, CL Tan,
who asked Mr. Ahmad to help him develop the company’s business outside China. Mr. Ahmad, who splits his time between China and Singapore, is also general manager of Desay SV Automotive’s Radio Navigation unit, which features a product line developed especially for the international market.

Mr. Tan describes his management style as easy going. “We’re not too concerned with hierarchy; we are pretty relaxed by Chinese standards,” said the CEO, who answers to CL or to Mr. Tan around his company. “I don’t show that stern face that you often see from Chinese company management.”

Johann Löttner, formerly the chief financial officer of Mannesmann VDO and Siemens VDO, serves Desay SV Automotive as an advisor to the board from his office in Germany.

One thing that sets Desay SV Automotive apart from many of its Chinese competitors, according to its management team, is its German roots. “Our factory was set up by Siemens; it looks and operates like a German factory,” said Mr. Ahmad. “The processes for project and product development are actually Siemens’ processes. In effect, we provide our customers with German engineering, but in China at Chinese costs.”

Low Manufacturing and Engineering Costs

The company’s manufacturing workers, all of whom are in China, take home about $500 per month, based on a 60-hour work week, which is typical. The city sets the official minimum wage. In addition, the employer’s cost includes about $200 in benefits, for social security payments, medical insurance and nearly free food and lodging. Workers are paid one-and-a-half times their regular pay for any overtime over 40 hours; for Sundays they are paid twice their regular pay; working on public holidays brings the pay to three times the regular hourly rate.

New engineers fresh out of college with bachelor’s degrees earn about $700 per month, including overtime. Engineers with five years of experience are paid from $1,200 to $1,800 per month, including overtime.

“Desay SV Automotive has been profitable every year since the year the joint venture was founded in 1986, except for the first year when it broke even,” said Mr. Tan. I asked him which financial numbers he watches most closely as he manages his company. “I watch the trend of manufacturing costs, the bill of materials and R&D costs. I also watch inventory. If you are not careful, that can kill your company. I also watch accounts receivable, and of course cash flow.” Desay SV Automotive has no longterm debt.

Constantly on the lookout for a possible acquisition, the company is interested in technology that will lead to a winning product. They have so far come up empty. “Unlike some Chinese companies that buy companies without looking at why, we are very, very careful,” said Mr. Tan.

Growing Sales Outside of China

In 2013, 19% of sales came from orders received from companies operating outside of China. In five years, Mr. Tan would like to grow the international business to 30% of the total, with China accounting for 70%. After that, he expects to maintain the 30%-to-70% ratio. “Both businesses will grow,” said Mr. Tan.

◆ Japan

After China, Desay SV Automotive does the most business with Japanese companies. Approximately 7% of 2013 shipments went to Japanese companies. In 2013, Desay SV Automotive created a subsidiary in Hiroshima-city to serve Mazda and other customers. Since 2012, Desay SV Automotive has supplied Mazda with radios, displays, CD players and USB hubs for vehicles manufactured in China by Mazda and Mazda’s joint ventures. The company hopes to also win Mazda’s next generation navigation platform for the Chinese market. In 2013 Mazda sold 184,257 Chinese-made vehicles in China.

Beginning in April 2014, Desay SV Automotive will begin production of navigation systems for a new vehicle launch in China. Desay SV Automotive’s role is to load an outsourced navigation engine into its head unit and then to integrate the navigation silver box with the display and controls. Navigation engines are typically purchased as a commodity product in China, much like CD players are.

In early 2013, Desay SV Automotive began shipping DVD players for Japanese vehicles assembled in Indonesia. Next year it plans to localize production of the DVD units with an Indonesian manufacturer.
That localization initiative will also support new radio business with other Japanese OEMs manufacturing in Indonesia for the Indonesian market.

In a few years’ time, as the business it has with Mazda and other Japanese customers grows, Desay SV Automotive expects its share of sales to Japanese OEMs and tier ones will nearly double.

**Germany**

In mid-2014 Desay SV Automotive will begin shipping basic double-tuner radios to Skoda, its first major contract in Germany. “We were really proud to learn a couple of weeks ago that Skoda’s test of our radios went very well,” said Johann Löttner. Desay is also producing some clock units for Skoda for the rear seat.

Yet more good news for Desay SV Automotive’s German prospects: The company won an order from a high-end carmaker to ship a 10-inch, infrared LCD touch screen. Production will begin in early 2015. “You don’t need to actually touch the display to interact with it, you just need to break the thin layer of IR above the glass,” said Mr. Löttner. “Winning business like this with a premium German carmaker will give us a good reputation to work with other German carmakers,” he added.

The Desay SV Automotive Europe subsidiary in Mainaschaff, Germany, near Frankfurt, was set up to serve carmakers and tier-one suppliers in Europe.

**United States**

Desay SV Automotive designs, manufactures and supplies Caterpillar with instrument clusters, radios and climate controls for excavators. The company, having been given the official status of global supplier by Caterpillar, hopes to win more interior electronics orders from Caterpillar.

**Southeast Asia and Elsewhere**

Rather than competing head-to-head with major suppliers such as Bosch and Continental, Desay SV Automotive has adopted a strategy that supports the wishes of many countries to provide their citizens with locally manufactured content. It has successfully built up production lines for customers in South America and the Middle East to support localization efforts and thereby reduce relevant duties and taxes.

Desay SV Automotive has been working with a large automotive OEM parts supplier in the Middle East. Because it is a small company, localization appears to be a viable business model for Desay SV Automotive. It eliminates the need for large investments in manufacturing resources, and it provides access to more non-Chinese customers.

Leveraging its localization experience in Indonesia, Malaysia, South America and the Middle East, the next step will be to apply the same business model in India, Russia and Eastern Europe, eventually for all the major product lines: radios, navigation, clusters and HVAC control units.

“We do all of the engineering in China,” said Mr. Ahmad. “We have agreements with our local partners that Desay SV Automotive reserves the right to dictate how the product will be produced to the level of quality that is expected. We are very serious when it comes to quality.”

**Alliances**

Desay SV Automotive is very small compared with the companies it competes with. It is very open to sharing its business opportunities with partners who can provide technology that might be missing, or access to markets and customers outside of China as the company expands globally. “The products are getting more and more complicated so we need to have good alliances,” said Mr. Tan.

**Peiker Acoustic**

Located in Friedrichsdorf, Germany, with strong links to BMW and Mercedes, Peiker produces acoustics, telematics, connectivity, multimedia and radio products.

The two companies complement each other: “Peiker didn’t have access to the Chinese market or a factory in China; we do,” said Mr. Ahmad. “And they have certain technologies that we don’t have. One good example is our cooperation on software for a double tuner that will go into production soon with VW Skoda.”

Peiker will provide its double AM/FM tuner for the radio project that Desay won with VW Skoda in the Czech Republic. One tuner is for audio reception and the other is for the data received from the RDS.
Desay SV Automotive

### Products

<table>
<thead>
<tr>
<th>Radio Navigation</th>
<th>Passenger vehicle TFT</th>
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<tbody>
<tr>
<td>Radio only</td>
<td>Passenger vehicle reconfigurable TFT</td>
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<td>CD radios</td>
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<td>6-CD radios</td>
<td>Construction machinery</td>
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<td>Display radios</td>
<td>Construction machinery monitors</td>
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<tr>
<td>Navigation</td>
<td>Clock module</td>
</tr>
<tr>
<td>Telematics</td>
<td>Indicators</td>
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</tbody>
</table>

### Climate Controls

- 4-Zone FATC (fully automatic temperature control)
- 2-Zone FATC
- 1-Zone FATC
- Integrated center stack
- ETC (electrical temperature control)
- MTC (manual temperature control)
- Rear seat controllers
- Black box

### Driver Information Displays

- Passenger vehicle stepper-motor clusters

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(Radio Data System) subcarrier. Peiker provides both the software and the hardware.

#### Rightware

Desay SV Automotive uses Rightware’s Kanzi UI Solution, a tool for rapid interface design and development, for its radio displays. “Rightware converts our HMI designs pretty quickly into software, which saves us time,” said Mr. Tan. “We were the first to use their software in China, and now we are their sole agent in China for the automotive application.” Rightware’s headquarters are in Espoo, Finland.

#### HTC

HTC and Desay SV Automotive signed a collaboration agreement in 2012 to develop SiVi LINK, which gives HTC smartphones access to the head unit for display and control. Thus far, SiVi LINK has only been promoted in the Chinese aftermarket and only works with some HTC phones. According to Mr. Ahmad, SiVi Link’s 25-frames-per-second data rate was an improvement over MirrorLink’s data transfer rate at the time, making for smoother video streaming from HTC handsets. Desay SV Automotive has also developed head units that link to smartphones via MirrorLink. HTC is also a charter member of the Car Connectivity Consortium supporting MirrorLink.

### Product Strategy

#### Navigation

Desay SV Automotive maintains two radio navigation business units. Radio Navigation Group Number One, under the direction of Mr. Ahmad, aims to serve global customers such as Volkswagen, Skoda, GM, Mazda and Nissan among others. Group Number Two serves the local Chinese carmakers, for example Geely, Chery and Great Wall.

“The global customers require adherence to strict processes and have high quality expectations, whereas the Chinese customers want inexpensive products that are developed quickly,” said Mr. Ahmad.

#### Reconfigurable Clusters

The company produces traditional single- or dual-dial instrument clusters based on stepper motors and has begun investing in the development of LCD-based reconfigurable clusters. The company wants to offer reconfigurable clusters that are inexpensive enough to penetrate the mid-priced car segment. In 2014 the company will begin promoting a new reconfigurable cluster based on a 12.3-inch LCD panel.

#### Advanced Development

Desay SV Automotive’s advanced development team is working on a number of projects to develop technologies that would support shipments in the 2018 timeframe. For example.

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the company is considering whether or not quad-core chips would then be powerful enough to run not only the radio navigation system but also a bird’s-eye-view camera system. Desay SV Automotive would like to offer a bird’s-eye-view camera priced low enough to penetrate the mid-priced car segment.

Another advanced development team is working to integrate the radio navigation unit and the climate control panel within the center stack.

### Competitive Strengths

One of the things that distinguishes Desay SV Automotive from its biggest global tier-one competitors is low R&D costs. According to Mr. Ahmad, a head-unit development project undertaken by a Bosch or Continental would cost anywhere from 5 million to as high as 20 million euro for R&D. “I can safely say that our R&D costs would be no more than 3 million euro and would more likely be in the range of 1.5 million to 2 million euro,” he said. “Another advantage that we have is speed. In China everything goes twice as fast.”

According to Mr. Tan, his company’s investment of 8.5% of sales in R&D is very high for a Chinese company, which more typically spends between 2% and 3% of sales on R&D. The company employs 750 R&D engineers, approximately 350 of whom write software.

Desay SV Automotive feels uniquely qualified to integrate the center console. Unlike many competitors, it makes all the pieces: displays, radio head units, navigation units and climate control panels.

Delivering good quality at a reasonable cost is the company’s mission. In the first two months of 2014, Desay’s radio navigation products shipped with a defect rate near its goal of 50 PPM. Desay SV Automotive believes that its quality performance is superior to its major Chinese navigation competitors, Hangsheng Electronics and Foryou General Electronics. “Our lead in product quality relates to our development, production and supply processes,” said Mr. Löttner. “We have good, close relationships to our OEMs and we are very transparent; we don’t hide anything. Overall, I’m convinced we are well ahead.”

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the early stages of getting into the [big data] space, exploring what is possible,” said Tim Nixon. “It has great promise, no doubt, but this is one of those things that will take time to mature.”

Aha Analytics
Harman International is already piloting a big data solution called Aha Analytics, which runs on its Aha cloud platform. Harman was using the cloud to support its own infotainment system development projects by pulling data from the radio in real time to troubleshoot any defects. Harman decided to expand that capability and make it available to carmakers who would use the service to collect and analyze data after sale.

“We have taken this tool that we created for debugging and will use it from a big data standpoint to do analysis on what customers are actually doing,” said Rahul Misra, director of connected services at Harman. “We’ll be able to tell carmakers what radio stations customers are listening to, whether the CD player is being used and what phones are brought in so they can make sure they pair with Bluetooth.”

Harman expects that Aha Analytics will be used beyond the infotainment system, once carmakers modify their networks so the radio bus has read access to the other vehicle buses.

JASPAR...
Continued from page 1

The Mobile Device Interface Working Group is creating interface requirements plus specification and implementation guidelines for connecting mobile devices with the vehicle. “We are working with the Wi-Fi Alliance and the NFC (Near Field Communications) Forum studying in-vehicle use cases for both those technologies,” said Mr. Kudo. “We are also working with the Car Connectivity Consortium because MirrorLink is the only open standard for smartphone connection in the car.”

According to Mr. Kudo, it is a common understanding among JASPAR members that JASPAR’s specifications will be used by Japanese carmakers and suppliers in their products and their development processes.

Big Data...
Continued from page 1

Tier-one suppliers looking to serve the fastest growing carmakers are likely calling on Hyundai-Kia and Volkswagen.

Supplier and OEM Ten-Year Growth History: 2003–2013

Tier-one suppliers looking to serve the fastest growing carmakers are likely calling on Hyundai-Kia and Volkswagen.

**Major Suppliers Sales and CAGR 2003–2013**

<table>
<thead>
<tr>
<th>Major Suppliers</th>
<th>2003 Sales in 2014 USD</th>
<th>2013 Sales in USD</th>
<th>CAGR %</th>
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<td>Continental Automotive</td>
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</tr>
<tr>
<td>Yazaki Group (FY ends 6/03, 6/13)</td>
<td>9.4 billion</td>
<td>13.4 billion</td>
<td>3.6</td>
</tr>
<tr>
<td>Valeo</td>
<td>12.7 billion</td>
<td>16.6 billion</td>
<td>2.7</td>
</tr>
<tr>
<td>Bosch Automotive Technology</td>
<td>32.3 billion</td>
<td>42.1 billion</td>
<td>2.7</td>
</tr>
<tr>
<td>JCI (FY ends 9/03, 9/13)</td>
<td>17.1 billion</td>
<td>21.8 billion</td>
<td>2.5</td>
</tr>
<tr>
<td>Lear</td>
<td>15.7 billion</td>
<td>16.2 billion</td>
<td>0.3</td>
</tr>
<tr>
<td>Delphi</td>
<td>28.1 billion</td>
<td>16.5 billion</td>
<td>-5.2</td>
</tr>
<tr>
<td>Visteon</td>
<td>17.7 billion</td>
<td>7.4 billion</td>
<td>-8.4</td>
</tr>
</tbody>
</table>

Reporting currency is converted to 2014 USD.

**Major Carmakers’ Unit Sales and Global Market Share 2003 and 2013**

<table>
<thead>
<tr>
<th>Carmakers by Region</th>
<th>2003 Unit Sales</th>
<th>2013 Unit Sales</th>
<th>CAGR of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyundai-Kia</td>
<td>2,505,460</td>
<td>7,559,687</td>
<td>11.7%</td>
</tr>
<tr>
<td>Nissan</td>
<td>2,968,357</td>
<td>5,102,979</td>
<td>5.6%</td>
</tr>
<tr>
<td>Toyota</td>
<td>6,070,400</td>
<td>9,980,000</td>
<td>5.1%</td>
</tr>
<tr>
<td>Honda</td>
<td>2,910,000</td>
<td>4,279,000</td>
<td>3.9%</td>
</tr>
<tr>
<td>Suzuki-Maruti</td>
<td>1,673,297</td>
<td>1,171,434</td>
<td>-3.5%</td>
</tr>
<tr>
<td>Mazda</td>
<td>1,069,400</td>
<td>1,015,939</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Total Asia</td>
<td>17,195,914</td>
<td>29,109,039</td>
<td>5.4%</td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volkswagen Group</td>
<td>5,015,727</td>
<td>9,300,680</td>
<td>6.9%</td>
</tr>
<tr>
<td>BMW</td>
<td>1,104,916</td>
<td>1,963,798</td>
<td>5.9%</td>
</tr>
<tr>
<td>Mercedes-Benz</td>
<td>1,341,638</td>
<td>1,565,563</td>
<td>1.6%</td>
</tr>
<tr>
<td>Renault</td>
<td>2,388,958</td>
<td>2,628,208</td>
<td>1.0%</td>
</tr>
<tr>
<td>PSA</td>
<td>3,266,100</td>
<td>2,818,695</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Fiat</td>
<td>1,989,921</td>
<td>2,092,000</td>
<td>-3.1%</td>
</tr>
<tr>
<td>Total Europe</td>
<td>15,127,260</td>
<td>20,798,944</td>
<td>3.2%</td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Motors</td>
<td>8,595,000</td>
<td>9,714,652</td>
<td>1.2%</td>
</tr>
<tr>
<td>Ford</td>
<td>6,724,000</td>
<td>6,330,000</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Chrysler†</td>
<td>2,637,867</td>
<td>2,238,000</td>
<td>-1.6%</td>
</tr>
<tr>
<td>Total North America</td>
<td>17,956,867</td>
<td>22,182,652</td>
<td>0.2%</td>
</tr>
<tr>
<td>Others</td>
<td>9,359,568</td>
<td>14,649,365</td>
<td>4.6%</td>
</tr>
<tr>
<td><strong>Total Global Sales</strong></td>
<td>59,639,609</td>
<td>82,840,000</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

† 2013 figures are Hansen Report estimates—Fiat-Chrysler doesn’t break out brand sales

Data: Carmakers, suppliers, Automotive News, IHS