Automotive connectivity: from connected cars to connected services

By Shamik Ghosh
About the author

Shamik Ghosh

Shamik Ghosh is an experienced professional with diverse knowledge of semiconductors, automotive electronics and wireless communication. Currently employed for Telematics Wire, he captures, edits and promotes the most relevant and talked-about trends ranging from connected cars, autonomous driving, smart mobility, Internet of Things (IoT) and many others. In his couple of years of experience he already has over 1,200 articles in his portfolio. His articles and bold comments on technology are widely recognized and attributed within the automotive community. He holds a Bachelor’s degree in Electronics & Communication Engineering.

About the editor

Soren Sarstrup, Managing Editor

Soren Sarstrup has spent most of his career working in the automotive intelligence industry. As founder and Managing Editor of Autelligence Ltd., he contributes extensive editorial and publishing experience, a global network of contacts on both the OEM and supplier side, in-depth understanding of the industry and the markets it operates in, hands-on sales and marketing experience, and, last but not least, a long-standing passion for all things automotive.
# Table of contents

**Acknowledgement** ................................................................. 5  
**Executive Summary** ................................................................. 6  
**Chapter 1: Know Your ‘Consumer’** ................................................ 8  
  1.1 Consumer expectations from modern vehicles ............................................. 8  
    EXPERT POLL #1 – How influential are connected services in making a purchase decision for new vehicle buyers? ............................................................. 8  
  1.2 ‘Connected’ services that make sense to a consumer ...................................... 11  
    EXPERT POLL #2 – What connected car services will become mainstream adoption in the near future? ............................................................. 12  
  1.3 Connected Services as OEMs “brand differentiators” ...................................... 16  
  1.4 Searching for a commercially viable business model … Are OEMs really making money? ............................................................. 18  
**Chapter 2: Connected Cars Connecting Industries** ........................................ 24  
  2.1 Towards an ‘open’ ecosystem: From value chain to value network ..................... 24  
  2.2 Telcos redefining their roles beyond connectivity ........................................... 28  
  2.3 Silicon drives the connected car .............................................................. 33  
  2.4 The connected car ‘app’ ecosystem .......................................................... 37  
    EXPERT POLL #3 – Will the entry of Apple and Google disrupt (or even threaten) the entire automotive value chain? ..................................................... 41  
**Chapter 3: Market Overview** .......................................................... 48  
  3.1 Geographical Overview of Connected Cars .................................................. 48  
    EXPERT POLL #4 – How would you compare the North American connected car market with the European market, in light of, ..................................................... 49  
    EXPERT POLL #5 – What are the prospects for the connected car market in emerging regions (MENA, BRIC, Australia, New Zealand, APAC, and LATAM) as compared to relatively developed markets? ............................................................. 57  
**Chapter 4: Market Trends** ............................................................. 59  
  4.1 Connectivity is the common thread ............................................................ 59  
  4.2 The battle for OBD-II supremacy: Hotspot for start-ups ..................................... 65  
    EXPERT POLL #6 – How is the aftermarket connected car industry going to look in future? ............................................................. 68  
  4.3 Connected cars intersecting with wearable tech ............................................. 69  
  4.4 Automotive players developing software capabilities ....................................... 73  
    EXPERT POLL #7 – We have seen automotive players acquiring more software arms into their business in recent times. Is it fair to extrapolate that automotive OEMs and Tier-1 suppliers are largely becoming “software” companies? ..................................................... 77  
**Chapter 5: Legislation and Mandates** ................................................ 79  
  5.1 The Pan European eCall Mandate ............................................................. 79  
  5.2 The Russian ERA-GLONASS .............................................................. 83  
  5.3 The Brazilian CONTRAN 245 legislation on Stolen Vehicle Recovery .................. 86  
    EXPERT POLL #8 – Is government legislation a blessing or curse for wide-scale adoption of telematics in a country? ............................................................. 89
Chapter 6: Market Challenges ................................................................. 91
   6.1 Future proofing connected cars .................................................. 91
       EXPERT POLL #9 – What is the best way by which OEMs can future-proof their “connected car”
       services? ............................................................................. 95
   6.2 Making an impenetrable ‘connected’ car .................................... 96
       EXPERT POLL #10 – Why is securing connected cars important and how can it be done in
       an optimal manner? ............................................................. 101
   6.3 The search for an appropriate pricing model .............................. 103
       EXPERT POLL #11 – How would a consumer like to pay for connected car services in
       the foreseeable future? ......................................................... 106
   6.4 Making sense of big data: The “holy grail” of industry ............... 108
       EXPERT POLL #12 – Who will have the ultimate ownership of connected car data? .... 112
   6.5 The missing link in the connected car value chain: Auto Dealerships ........................................... 113
       EXPERT POLL #13 – How are auto dealerships going to benefit from an increasing uptake
       of telematics and connectivity by OEMs? ............................... 116

Chapter 7: Conclusions ............................................................ 118

Chapter 8: Strategic Recommendations ........................................ 120

Company profiles .............................................................................
Airbiquity ...................................................................................... 123
AT&T ........................................................................................... 126
Audi ............................................................................................. 129
AUPEO ....................................................................................... 132
BMW ......................................................................................... 135
Bosch .......................................................................................... 138
Continental ................................................................. 142
Daimler ....................................................................................... 146
Delphi Automotive .......................................................... 149
Elektrobit Automotive ............................................. 152
Fiat-Chrysler Automobiles (FCA) ........................................ 155
Ford Motor Company .................................................. 158
General Motors .......................................................... 161
Harman International ..................................................... 164
Hyundai .............................................................. 167
INRIX ................................................................. 170
Jaguar Land Rover ............................................................. 173
Jasper Wireless ............................................................. 176
Mojio ......................................................................................... 178
NVIDIA ..................................................................................... 181
NXP Semiconductors ..................................................... 184
Parrot Automotive ............................................................ 187
QNX Software Systems ..................................................... 191
SiriusXM .............................................................. 194
Tesla Motors .............................................................. 197
TomTom (Tom2) ............................................................. 200
Verizon Telematics ............................................................ 204
Visteon Corporation ..................................................... 207
Vodafone .............................................................. 210
Volkswagen .............................................................. 213
Table of contents

Figure 46: Mojio OBD-II dongle ......................................................... 179
Figure 47: Audi Virtual Cockpit powered by NVIDIA .................................. 183
Figure 48: NXP-NTU Smart Mobility Test Bed ........................................ 186
Figure 49: Parrot’s RNB6 infotainment system ........................................ 189
Figure 50: Tesla Model S Infotainment Systems ........................................ 198
Figure 51: Verizon Vehicle (HUM) ....................................................... 206

Table of tables
Table 1: Connected Car Services .......................................................... 16
Table 2: “Monetizing Points” for Automotive OEMs ................................... 22
Table 3: Connected Car Stakeholders ..................................................... 26
Table 4: Automotive App Development Strategies ................................... 38
Table 5: Apple CarPlay vs. Android Auto .............................................. 45
Table 6: OEMs and their connectivity type .............................................. 62
Table 7: MirrorLink powered car models ............................................... 64
Table 8: eCall deployment status ......................................................... 80
Table 9: ERA GLONASS implementation stages ..................................... 86
Table 10: Software Recalls performed by OEMs recently .......................... 94
Table 11: Connected Car security vulnerabilities .................................... 97
Know Your ‘Consumer’

Beyond horsepower and torque...

This chapter covers:

• How much do consumers want connected cars?
• What connected car services are beyond the hype and mostly demanded by consumers?
• Are connected features influencing the purchase decision of new vehicle buyers?
• Are connected features becoming the chief selling factor for automotive OEMs?
• Is there a commercially viable business model around connectivity & telematics?

1.1 Consumer expectations from modern vehicles

“I’ll take it in black, white or red, whatever you’ve got, as long as it has all these (connected car) features.”

—Svetlana Friedman, 33 asking her dealer

We are living in an era where consumer lifestyle is defined by the plethora of mobile devices available. Consumers today use smartphones, laptops, and tablets to manage more and more aspects of their daily lives. We use iPhones, iPads and their Android-based equivalents constantly to shop, navigate, entertain, book a movie ticket or cab and share a picture with someone remote. Technology is entering into almost every aspect of modern life. So why should this lifestyle stop the moment you enter your car?
A successful execution of a connected car solution will require stitching together back end IT systems, carrier infrastructure, and third party specialized service offerings. OEMs need to understand these challenges on behalf of their customers and forge strategic relationships with the other vendors in the solution stack. Sometimes some simple pre-integration or cooperative planning at the outset between two infrastructure providers can make all the difference in the deployability and serviceability of an offering.

The connected car ecosystem also includes telematics service providers (Airbiquity, UIEvolution, Atos, Lochbridge). These consulting and management service companies are dedicated to developing and managing connected car efforts. They have evolved from being mere “service providers” to “system integrators” and directly work with the OEMs. This is a clear indication as to how companies have expanded their business portfolios to address multiple segments (app development, security, software integration) in order to make the most of connected car opportunities. As the financial impact of connected cars will grow it will become increasingly strategic to interconnect all the service offerings in a standard manner and avoid fragmentation.

New and future stakeholders also have to redefine their roles beyond their core competency.

Figure 8: Connected Car Open vs. Closed Ecosystem

<table>
<thead>
<tr>
<th>Closed ecosystem 2012</th>
<th>Open ecosystem 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM → Customer → Supplier</td>
<td>Politics → Cloud services → Energy suppliers</td>
</tr>
<tr>
<td>Current system boundaries</td>
<td>Future system boundaries</td>
</tr>
</tbody>
</table>

> Clearly defined tasks and responsibilities
> Clear processes and structures
> Long established business models and rules

> New players – closer interaction of players from different industries
> New business models and revenue streams

Source: Roland Berger

The point is that the car’s ability to be ubiquitously connected will not only simplify the equation between consumer and OEM but also open doors for so many unfamiliar and unthinkable stakeholders, who no one thought would become an important part of the value chain. The following table lists the type of companies involved in the connected car development.

The information mentioned about connected car stakeholders in Table 3 can never be comprehensive and veracious. This is simply because with the ever evolving nature of the connected car market, the role of players is not fixed and tends to change every now and then. You never know who will enter into the market.
no such law exists in the US. In the US, we expect to have NHTSA advance the rulemaking to require V2V safety messages at the end of 2015, whereas pan-European implementation of such a law would be difficult.

Ben Hoffman, Chief Executive Officer | Movimento

Consumer awareness is similar with many OEM providers offering private connected vehicle service offerings. In Europe, as eCall makes the latest move toward full legislative approval with a March 2018 production target, all three key factors will be pushed forward at once – industry readiness, regulatory framework and consumer acceptance. With all major OEM product plans global in nature, the European eCall initiative will help continue the embedded connectivity trend seen recently in North America.

The Connected Car Market in both Europe and North America has gradually become more similar over the past 3 years and will continue a path of commonality and alignment through 2018.

Lars Reger, CTO-Automotive | NXP Semiconductors

In all three categories I don’t see huge differences between Europe and North America.

For industry readiness, when we look at the companies that are involved in the connected car market it’s obvious that they are all global players who are looking to scale rather than promote or serve a specific region. However, if they do need to meet different regional standards, they develop clever solutions to mitigate the impact this may cause.

The regulatory framework for V2X in the US is set by IEEE, and compatible standards are adopted in Europe and Asia regardless of how the organizations or standards are named: the objectives are similar.

For consumer awareness I don’t see a difference between regions either. In the US you have GM or Tesla as connected car pioneers, while in Europe you have Audi and BMW, for example. But regardless of car brands, if the consumer wants to control their BMW or Audi with a Smart Watch that’s what they’ll get in the end – so it’s the consumers who are making this a global game.

Dr. Nick Reed, Academy Director | UK Transport Research Laboratory (TRL)

There appear to be similar challenges in Europe and North America in developing standards for the deployment of connected vehicles. In a rapidly changing technology landscape, both in terms of vehicle and communications systems, it is difficult to set out the standards and regulations that would facilitate deployment. However, the potential safety, comfort and efficiency benefits that may be achieved are such that these challenges will be overcome.

Jan-Maarten de Vries, Vice President-Product Management | TomTom Automotive

We see traditional automotive markets such as in-vehicle infotainment and “newer” automotive markets such as Active Safety (ADAS) and Telematics Services converging to what we call connected car market. With respect to Telematics Services, North America is the leading regional market for OEM deployed connected telematics solutions. The European market, on the other hand, is currently leading a series of initiatives in the field of active safety, promoted by certification institutions such as EuroNCAP (e.g. promotion of ADAS) and regulatory institutions (e.g. mandate for eCall) while in the USA there are targeted initiatives towards automated driving on highways, in particular for commercial transportation (platooning). The connected car market is expected to grow as car connectivity becomes widely spread in both regions. In 5 years from now, it’s expected that 9 out of 10 light vehicles sold will be connected.

Brazil, Russia, India, China (BRIC)

BRIC countries have emerged as a hot-spot for the global connected car market due to surging economic growth, the rise of the middle class, and the increasing demand for private cars. Despite their large cultural differences, the BRIC countries feature emerging middle classes and a new population of drivers and mobile users who will benefit from telematics. The market is beginning to open up and as it does, the industry sees it as a big market to do business in.
The top automotive brands deepened their relationship with A&G to bring wearable tech in car and the announcements followed each other in quick succession.

At the 2015 CES, Hyundai demonstrated the Blue Link smartwatch concept in partnership with Station Digital Media that allows Hyundai owners to voice activate remote start, lock and unlock doors as well as find their car in a crowded parking lot. The app is soon to be available in LG, Motorola, Sony and Samsung smart watches.

Tesla hired a Ukrainian start-up ELEKS to develop an app to be featured in the Apple Watch. The app lets owners to check Tesla’s current battery status and available range, the state of climate in the car and even control certain functions, like locking and unlocking the doors, turning on the headlights, and making the car beep.

**Figure 27: Tesla iWatch App**

![Tesla iWatch App](image)

Source: Eleks Labs

**BMW, Volkswagen and Porsche** soon announced the compatibility of their in-vehicle infotainment system, i.e. ConnectedDrive, Car-Net and Car Connect respectively with an Apple Watch. The recent announcements have come from Volvo and Honda. Volvo recently updated its Volvo On Call app to make it compatible with both Apple Watch and Android Wear. Honda announced a new telematics service called “Road Hints” that is directly connected with Apple Watch and enables drivers to check the remaining fuel level and distance capable of being travelled besides average fuel consumption and driving performance.

On the commercial vehicle side, Scania, the Swedish premium truck maker is taking the lead. Scania launched a smartwatch, “Black Griffin” in partnership with Sony Mobile. The wearable device may be worn by drivers who can use to it collect information on variables including fuel consumption, driving efficiency and average speed. It can also be used to receive email, text message and phone call notifications.

Aside from carmakers, INRIX, the traffic information provider to OEMs like Audi, BMW, Ford, and Mercedes, has integrated wearable technology into cars. INRIX recently collaborated with Samsung to utilize their new lineup of mobile devices, including Galaxy Note 4, Galaxy Note Edge, and Gear S to incorporate their updates on real-time traffic via their travel app. Consumers, with a special feature, “Car Mode” can set their device to automatically switch to a driver friendly user interface that uses voice controls and larger, crisper
devices). Each equipment manufacturer had its own specification. This culminated in the creation of a new standard for protocol communication between devices called ACP245 (Application Communication Protocol).

With CONTRAN 245, the customer can now select any other communication protocol (tied to a specific equipment manufacturer) that provides other services, but the original protocol, i.e. the ACP245, will be on file to provide total transparency and interoperability.

In spite of the benefits it will give Brazilians, the repeated delays (dozens of them) have cooled the initial excitement amongst stakeholders. In light of the different possible scenarios, vehicle OEMs and other participants along the value chain are unsure whether to introduce telematics services just yet. Car makers think it would be too premature to develop any technology in this regard, only to render them obsolete after some time.

Roger Lanctot of Strategy Analytics cautions

Because of the delays, OEMs have to go back to the drawing board. This creates supply chain disruptions.

Strategy Analytics noted in one of its reports that two-thirds of respondents felt that the legislation would “never” be implemented and 60% said they did not think it was a good idea. While several car companies laid plans for implementing the program and developed hardware and software and conducted testing, others more or less ignored the mandate never believing it would reach the market.

The general consensus amongst OEMs is that the solutions with only the basic legal functionalities (stolen vehicle tracking) are not attractive to customers and the service activation, which is optional, will not be done. Value added services to the solution are very important to motivate customer acceptance and the activation of the service. This ongoing debate regarding “inflexibility” to accommodate other connected services to offer customers, is slowing market introduction and current potential.

Giving an example Cyril Zeller, Vice President of Marketing, Telit criticizes CONTRAN 245,

It’s a terrible limitation. In addition to the CONTRAN tracking device, I’m going to need a second device for fleet management, I’m much more likely to go after some service that will offer both.

It is also acknowledged that the repeated delays were not only for technical reasons, but also political ones. Christiano Blume, LAM Host Manager of Volvo Brazil who has been involved with CONTRAN 245 ever since its beginning in 2007 explains the following reasons for repeated delays:

- **Technical** – The government has underestimated the complexity of the proposed solution and the impact over the customers, supplier chain and automotive industry in Brazil, which has involved new technologies and complex processes for HW and SW development, validations and service management.

- **Political** – Some big OEMs were against the proposal and have created political obstacles in the process, influencing the authorities. Some lawsuits have been also filed against the proposal, what has created several delays and constraints on implementation. One of the main concerns is the added cost, mainly in the so called “popular versions” for passenger cars and for motorcycles, where each single “dollar” added to the cost and profit margins.

- **Privacy constraints** – At least two big lawsuits were filed by the Brazilian justice system against CONTRAN 245 regarding privacy customer rights, which have demanded late changes in the solutions already in advanced development phases.

Furthermore, the mandatory fitment of telematics devices would add about US$250–300 on the vehicle sticker price in a market which is already awash with exorbitant vehicle taxes. It is for that reason; the National Association of Motor Vehicle Manufacturers (ANFAVEA) requested a meeting with President Dilma Rousseff and members of her cabinet.
GM is providing targeted marketing only in the US and Canada and no other carmakers have followed its steps elsewhere. This highlights an important limitation of targeted advertising, i.e. the scale. When media agencies plan advertising campaigns for their clients, they expect reach – the number of people in the audience, or the number of times each person will see the ads.

**Figure 36: In-car Transactions**

![In-car Transactions](source:sap)

For OEMs it becomes a challenge to create a business model that offers unprecedented opportunities for direct, customer-specific and targeted marketing to monetize the consumers’ needs. Third party service providers (telcos, IT, system integrators), on the other hand, want a recurring revenue stream from the connected car while remaining noticed in the value chain.

**EXPERT POLL #11 – How would a consumer like to pay for connected car services in the foreseeable future?**

- One-off payment at the time of car purchase
- Pay-As-You-Go
- Monthly/Yearly Subscriptions
- Basic services at no cost with the purchase of additional functionality (Freemium)
- In-car transactions based on advertisements

**Tien Tzuo, Chief Executive Officer | Zuora**

It will probably be a combination of freemium and subscriptions in the initial period with subscriptions taking over in the long run. Unlike one time purchases, which tend to tie you to the model/version purchased, subscriptions free up the customer to switch to the newest offer. That’s the beauty of subscriptions. With connected cars just emerging, customers will not want to lag behind and miss out on the ‘latest experience’.

**Pascal Pediroda, Connected Vehicles & Living Product Manager | Worldline, an ATOS company**

It’s mandatory for connected car services solutions to be flexible enough to be able to change their business model over the course of a car’s lifecycle. What is paid with a subscription fee today, for example, may be free in a year’s time.
**BMW**

**INTRODUCTION**

BMW broke new ground in 2004 by integrating an Apple iPod in its cars, bringing playlists to life behind the wheel. BMW presents an excellent blend of convenience and safety related features to its customers through its flagship in-vehicle system i.e. ConnectedDrive. For its 2014 models, the luxury automaker bumps up its multi-tiered infotainment system, BMW ConnectedDrive, with point-of-interest voice search, enhanced navigation tools and seamless connectivity to your smartphone. BMW also developed of Remote Valet Parking Assistant in BMWi3 allows the driver to find a spot in any parking space on its own and with another tap the system delivers itself back to the driver’s control.

The company owns three brands in the automobile industry: BMW, Mini, and Rolls-Royce and all the three brands have been equipped with the latest Infotainment systems. Headquartered in Munich, Germany the Automotive segment of BMW nearly contributes 93% of the total revenue and has 1,06,064 employees working in this segment primarily focusing on China, USA and Germany.

**KEY PEOPLE**

- Dieter May, Sr. Vice President- Business Models (Munich)
- Stefan Hoch, Executive Vice President of connected drive BMW (Munich)
- Stephan Durach, Vice President-Communication Electronics (Munich)
- Sebastian Zimmermann, Head of Automotive Connectivity and Secured Solution (Germany)
- Peter Burgner, Head of BMW AppCenter (California)
- Uwe Higgen, Head of BMW Group Technology Office(California)
- Alexander Busch, Head of Infotainment & BMW Connected Drive Integration & Testing (Munich)

**KEY SERVICE OFFERINGS & PRODUCTS**

<table>
<thead>
<tr>
<th>TYPE OF SERVICE</th>
<th>ASSOCIATED PRODUCTS</th>
<th>FALL</th>
<th>PARTNERS (IF ANY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADAS</td>
<td>Predictive Parking</td>
<td>2015</td>
<td>INRIX</td>
</tr>
<tr>
<td>ADAS</td>
<td>Remote Valet Parking Assistant</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>Infotainment</td>
<td>Apple Car Play solutions</td>
<td>2014</td>
<td>Apple</td>
</tr>
<tr>
<td>Autonomous Driving</td>
<td></td>
<td>2014</td>
<td>Baidu</td>
</tr>
<tr>
<td>Smartphone Integration</td>
<td></td>
<td></td>
<td>Samsung</td>
</tr>
<tr>
<td>In-car Connectivity</td>
<td>M2M platform/Embedded SIM</td>
<td>2014</td>
<td>Vodafone</td>
</tr>
</tbody>
</table>

The breakdown of the Remote Valet Parking Assistant to show the products, names of the applications that run off them and their launch dates as follows:

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>FEATURES/SERVICES</th>
<th>LAUNCH FALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Valet Parking Assistant</td>
<td>Smart Charging app</td>
<td>Jun 2014</td>
</tr>
<tr>
<td>Remote Valet Parking Assistant</td>
<td>Laser light technology in the BMW i8</td>
<td>Feb 2014</td>
</tr>
<tr>
<td>Remote Valet Parking Assistant</td>
<td>Concept plug-in hybrid vehicle</td>
<td>Feb 2014</td>
</tr>
<tr>
<td>Remote Valet Parking Assistant</td>
<td>Automated parallel parking</td>
<td>Jan 2014</td>
</tr>
</tbody>
</table>
CLIENT/PARTNER ANALYSIS

The following table includes companies that Elektrobit delivered products to between 2010 and 2015.

<table>
<thead>
<tr>
<th>PRODUCT/SERVICE</th>
<th>FALL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automotive partners</strong></td>
<td></td>
</tr>
<tr>
<td>Audi</td>
<td>Developed Audi Electronic Fault Information System</td>
</tr>
<tr>
<td>Daimler</td>
<td>Developed Daimler’s embedded driver assistance software</td>
</tr>
<tr>
<td>Ford</td>
<td>Aids in bringing new features to Sync, including Vehicle Health</td>
</tr>
<tr>
<td>Volkswagen</td>
<td>Development of navigation and user experience features</td>
</tr>
<tr>
<td><strong>Non-Automotive partners</strong></td>
<td></td>
</tr>
<tr>
<td>Inrix</td>
<td>Develops next-generation navigation systems with a variety of new driver-assistance features.</td>
</tr>
<tr>
<td>QNX</td>
<td>Developed advanced technologies for safe and comfortable driving</td>
</tr>
</tbody>
</table>

REVENUE ANALYSIS

<table>
<thead>
<tr>
<th>FORECASTED COMPOUND ANNUAL GROWTH RATE (CAGR) IN AUTOMOTIVE TELEMATICS (2012–2016)</th>
<th>ELEKTROBIT REVENUE AS AT 31 DECEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.67%</td>
<td>2013  2014  % CHANGE</td>
</tr>
<tr>
<td></td>
<td>US$226 million  US$254 million  12.5% rise from the previous year</td>
</tr>
</tbody>
</table>

The growth in net sales and operating profit was mainly due to the good development of the Automotive Business segment. Net sales of the Automotive Business segment amounted to €171.4 million (US$194.4 million) representing an increase of 24% from the previous year 2013 which amounted to €138.3 million (US$157 million) due to the demand for EB’s software products, R&D services and the performance of its jointly owned company e.-solutions GmbH.

The share of R&D investments in the Automotive Business segment was €13.2 million (US$15 million) (€14.3 million, in 2013) and in the Wireless Business segment €6.9 million (US$8 million) (€4.2 million in 2013).

LATEST ABOUT ELEKTROBIT AUTOMOTIVE

<table>
<thead>
<tr>
<th>DATE</th>
<th>ANNOUNCEMENT</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 2015</td>
<td>Elektrobit releases EB Guide 6 automotive software update</td>
<td>EB GUIDE 6, the latest version of the Elektrobit (EB) Human Machine Interface (HMI) development product. EB GUIDE for HMI design</td>
</tr>
<tr>
<td>Jun 2015</td>
<td>EB sells its Automotive business to Continental AG in US$680 million</td>
<td>To better position it to drive the automotive software and business models of the future for the global Tier-1 company.</td>
</tr>
<tr>
<td>Jan 2015</td>
<td>EB signed a partnership agreement with Voicebox</td>
<td>Helped in allowing each to offer their combined solutions to deliver a multi-modal Human-Machine Interface (HMI) development platform to the automotive world.</td>
</tr>
<tr>
<td>Jan 2015</td>
<td>EB invested to establish a development center in the San Francisco-Bay</td>
<td>Assisted to manufacture software and systems for in-car connectivity and autonomous driving.</td>
</tr>
</tbody>
</table>
Company profiles

PARTNERS | PRODUCT/SERVICE | FALL
---|---|---
Deutsche Telekom | Investment of US$8 million | Mar 2015
AT&T | Aids in allowing Mojio’s open connected car platform to connect to almost all vehicles worldwide. | Jan 2015
Microsoft | Development of Windows Phone apps in five categories | Jan 2015
Telus | Launch the innovative Mojio connected car solution in Canada | Sept 2014

REVENUE ANALYSIS

Mojio is a private company and is not obliged to reveal its financials.

Figure 46: Mojio OBD-II dongle

Source: Mojio

LATEST ABOUT MOJIO

<table>
<thead>
<tr>
<th>FALL</th>
<th>ANNOUNCEMENT</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 2015</td>
<td>Mojio launches new Drive ecosystem of car apps</td>
<td>Mojio Drive is an expanding marketplace of apps and services. It includes a suite of more than 20 connected car apps and services to enhance their driving experience. App categories include vehicle maintenance and repairs, roadside assistance, auto insurance, safety and security and productivity.</td>
</tr>
<tr>
<td>Mar 2015</td>
<td>Deutsche Telekom invests in Mojio</td>
<td>Mojio closed an $8 million Series A funding round led by Telekom Capital, the investment arm of Deutsche Telekom.</td>
</tr>
<tr>
<td>Jan 2015</td>
<td>Mojio signed a partnership agreement with Microsoft</td>
<td>Aids to drive the development of Windows Phone apps in five categories: green, to reduce drivers’ carbon footprint; gamification business, enabling better management of time and resources.</td>
</tr>
<tr>
<td>Jan 2015</td>
<td>Mojio signed a technological agreement with AT&amp;T</td>
<td>Aids in allowing Mojio’s open connected car platform to connect to almost all vehicles worldwide.</td>
</tr>
</tbody>
</table>