25 May 2015
Volume 2, Issue 4

The Dispatcher

Special interest features covered in each issue:

- Autonomous and Self-driving Cars
- Big Data
- DSRC versus Wireless Communication
- Connected Vehicles – V2V and V2I
- Third party services for eCall

Individual Highlights:

In the next issue:

- Cars and trucks as robots
- Neighbourhood electric vehicles (NEVs)
- Disruptive business models—and models that are not as disruptive as one might think

We will take a break for the summer months and return in time for the conference season in September.

Telematics Industry Insights by Michael L. Sena

The Future of Vehicle Navigation

"*WHAT IF THIS IS AS GOOD AS IT GETS!*" exclaimed Jack Nicholson to his fellow patients in the waiting room to their psychiatrist's office in the 1997 movie, 'As Good as it Gets'. I had this thought in April as I was driving with two colleagues from Milton Keynes to the Birmingham Airport. It was evening rush hour and my colleagues had a plane to catch. Both the navigation system in the rented Peugeot and Google on one colleague's smart phone were in agreement on the route. Both were dead wrong. They routed me on the M1 and A45. The M1 was under construction, as usual. The ever-present orange cones funneled traffic into ever-slower lanes, and the signs warned that the speed cameras were measuring average speed. With all of the construction on the M1, I did not realize I was on the A45 until it was too late. We should have arrived, according to both systems, at 18.27. We arrived at 19.00. My colleagues made it to their plane—just—but it was an uncomfortable drive.

Will navigation systems ever be able to give drivers useful directions as long as road works, accidents and incidents and uneven levels of driving skills cause the road infrastructure to be as dysfunctional as it is in many major metropolitan regions? Is this as good as it is going to ever be?

There are two problems, as I see it. First, there is the problem of the base map data and dynamic traffic information that must modify the conditions for calculating a route and make a recommendation to the driver on which route to select. Both of these data sources must be accurate and up-to-date. An incorrect speed limit or inaccurate turn restriction can mean the difference between arriving on time and missing the plane. Second, there is the route calculation software. It uses the map data and should at least attempt to process all of the relevant attributes delivered by the map data supplier, and then incorporate the dynamic traffic data in order to present the best possible route to the driver.

I have been thinking about the whole paradigm of on-board navigation, and I have not been feeling very positive about it. I decided to find out what you are thinking, so I sent out three questions to fifteen of you who are working in this arena. Eleven of you replied. Many thanks.

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HERE IS (MAYBE) FOR SALE.[1] No news there. What was Nokia thinking when it bought **NAVTEQ** (for some unknown reason re-named to **HERE** after the acquisition in 2008)? It was simply a matter of time before it figured out there were no synergies. I thought it would have been a logical move for Microsoft to buy **NAVTEQ** when it bought Nokia's mobile phone business in September, 2013. Actually, it would have been even more logical for Microsoft rather than Nokia to have bought **NAVTEQ** back in 2008. Apparently, Microsoft (and Google and Apple) did not feel they needed to buy the principal supplier at the time of on-board navigation map data, just as they did not feel they needed to buy the other map data supplier, Tele Atlas, which was acquired by TomTom at the same time. Microsoft must have had a sweetheart deal for licensing **NAVTEQ** data. *Why incur the costs of maintaining it when we just need to pay the annual fees?* must have been the thinking. Google already had its own still secret plans for producing its own database for its own navigation, route planning and location-based services applications. Apple wasn't thinking maps.

Seven years later, while **HERE/NAVTEQ** has been starved for budget to keep its data the best there is, Nokia wants to make the company someone else's problem. Maybe it's not too late. A new owner with a real interest in the future of in-vehicle navigation, advanced driver assistance and self-driving vehicles might do the right thing and give the company the resources it needs to succeed. Start by changing the name back to **NAVTEQ**, *PLLLLEEEEEEASSE*.

The Future of Vehicle Navigation (Continued from P.1)

On question #1 (see sidebar to right for all of the questions), all but one of the respondents said that embedded navigation would continue into the foreseeable future. "There's just too much money riding on today's infotainment platform that they (the OEMs) can't just make it a blank screen that can be monetized by third parties." One OEM responded as follows: "Navigation take rate is growing. We saw a 100% increase between 2009 and 2012 models, and a further 50% increase in 2014 and 2015." The embedded systems win on features, ease of use, quality of integration, ability to work with on-board sensors for advanced driver assistance and car-to-car communication. Costs for these systems are also dropping. Most felt that embedded navigation would become more and more premium, with the lower-end vehicle segment moving to the non-embedded alternatives. By 'premium' is meant having new and innovative features that make driving easier and safer. It also means being 'connected'. Even though the maps and software are on-board the vehicle, points of interest and real-time traffic information need constant updating.

Then there is the issue of legal restrictions on the use of mobile devices. "Some jurisdictions prohibit the driver from touching the brought-in device while driving, although many in-dash units also lock out while moving." Good voice recognition can resolve this problem, but there is still much to be done to have a system that works without the irritating misunderstandings. Network coverage will continue to be a problem, especially when we are out of our home countries or in Nebraska.[4]

The dissenting voice said: "Almost everything about off-board navigation is superior, except for the nice look and feel of a high-end navigation system and the fact that it will have slightly better performance in fringe reception areas...and be better integrated with inertial sensors." Those of us who have experienced integrated navigation know that updating maps and features is not one of its strongest points. It is easier to keep the phone-based apps up-to-date, and even though the off-board map databases are not updated in real time, it is more likely, but not certain, they will have roads built within the last year or so versus those with the data in the vehicle.

On question #2, there were very few definitive recommendations, just suggestions. Only one picked his own company, and none of the OEMs picked the system provider they were currently using (open-mindedness or the grass-is-never-green syndrome). Elektrobit ("solid; autograde; expensive), NNG ('value leader; super-fast; good to customize") and Here Auto ("knows their OEM customers; true end-to-end solution) received the most

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Vehicle Navigation Questions

1. Is there a future for embedded navigation? *By 'embedded' I mean software running on board the vehicle, not on a separate wireless device or off board the vehicle on a server.*

2. Who is your pick for the top supplier of on-board navigation software? *There was a time when hardware and software were one and whoever was chosen as the navigation system supplier was responsible for the software that presents maps and calculates the routes. With the componentization of vehicle navigation, software is a separate component and can be sourced separately from the display and positioning hardware.*

3. Will off-board navigation replace on-board navigation, and if so, who is your pick for the best supplier? *This is a companion question to number one. Even if embedded navigation does continue to exist in some form in some models, off-board navigation of the type delivered to wireless devices by Google, Here/Navteq or Appello, among many others, is increasingly common.*

I asked if I could quote their responses. A few of them said yes, but most said they would prefer anonymity since they were not responding officially from their respective companies. So I will make all responses anonymous but in quotes.

News Release: "Tesla China has announced a deal with Chinese mapping company NavInfo that will support satellite navigation in the Tesla Model S in China. Normally, the navigation system of the Model S works with Google Maps, which is blocked in China, which forced Tesla to delete the system altogether, leaving Chinese Tesla owners without a factory-installed navigation system."

OnStar returns to Europe

GM announced at the Geneva Motor Show that it is bringing **OnStar** back to Europe. Welcome. Better luck this time.

In 1997, when GM decided it was time to open up the European market for telematics, it studied two countries mirroring its two principal brands, Vauxhall and Opel.[2] It worked with the AA in the UK and ADAC in Germany to provide services similar to those its own call center provided in the US. In the end, GM decided to focus on Germany with ADAC delivering services. It created a GSM-based system with a customer-provided SIM-card. The system worked in Germany. It was less than a hit. Before GM closed it down completely in 2004, Stan Sikorsky, then its general manager, tried to create a real service package with a totally redesigned platform, but it was too late. What will OnStar be in its European reincarnation when services start in August 2015?

The news releases talk about Opel OnStar, but the headquarters for the European OnStar programme will be Luton, UK, not in GM's European headquarters in Russelsheim. Vauxhalls, not Opels, are sold in the UK. Could this be an attempt to address the first try's failure to get the Opel team to rubber stamp the US operation's system and service design? It looks like it is mainly a decision to have the multi-lingual call center in a native English-speaking country. This time around OnStar will be sold on both Vauxhall and Opel brands with initial sales of the system in thirteen European countries, including the usual suspects, Republic of Ireland and Poland, but not Russia.

We will follow the events leading up to OnStar's re-entry in Europe with interest and hope they are here to stay this time.

deCarta is no 'start-up'; Uber is an up-start.

IT WAS THE AUTUMN OF 2000. Two of my principal clients, the Automobile Association and Rand McNally, had recently been acquired and all consultant contracts, including mine, were terminated. I suddenly had a lot of free time. A former Volvo colleague, Rikard Bergsten, called. He had left Volvo at the height of the dot.com boom to start his own company developing applications for mobile phones. His company had been acquired by Sweden's most dynamic IT company at the time, *Framfab*[5], led by Sweden's leading IT personality, Jonas Birgersson. Did I want to join? Rikard's ambition was to build a business offering all types of location-based services (LBS) on all types of Internet-enabled devices. I chose the safe route and joined as in a consulting role. I was issued a computer, a desk and a business card and I started preparing the requirements for an LBS server.

This wasn't the first time I was in this position, but it was the first time that the end users would be on mobile devices. There were three options: build from scratch; buy a company; or, license a platform. MapQuest had recently been gobbled up by AOL, so that ruled them out. Microsoft had already acquired AutoRoute. Rikard and I met with a company in the south of Sweden called *Wayfinder*. It had a decent mobile phone-based mapping application at the time, but the owner put a price tag of $100 million on his company, which was a couple of zeros too many—not because we could not have come up with the money, but because it was not worth the price. To build from scratch would have taken more time than we knew we had to get to market, and we would have to poach every bit of talent.

There was one company that came to mind as either an acquisition candidate or as a potential licensor of its software: **Telcontar**. I knew some of the principals from a dozen years previous when I completed an evaluation of Navteq and Etak as investment candidates for the American Automobile Association (AAA). AAA took my recommendation and invested in Navteq. Etak, and eventually Tele Atlas, never quite forgave me, but the former Etak employees who founded Telcontar bore no obvious grudge. We met in their downtown San Jose offices for a few days and signed them up to deliver their platform to Framfab.

For a few months we made enormous progress. Telcontar had oversold some capabilities, but its management saw the opportunity to work with us to improve their platform. We expanded the team and all was going well until sometime in the early part of 2001 when I read the headlines in the morning paper as I was taking the train into the Framfab offices in central Göteborg. Framfab had crashed! Within days the entire company disappeared. The team I worked with was sold to EDS (who had built the OnStar telematics platform), and it went into a holding pattern for the next three years. Suddenly, once again I had a lot of time on my hands.

Rikard left the team in the hands of Leif Sundström (also a former Volvo colleague) and a few other die-hard friends. They kept the contact with Telcontar and continued to develop the applications using its **Drill Down Server** platform. They eventually bought themselves out from EDS in 2004 and formed a company called Appello. Its *Wisepilot* software has been on the market since then.

Just about the time Framfab was crash landing, Telcontar was taking off. Google, Yahoo, Rand McNally, Verizon, OnStar and many others were all basing their mapping applications on Telcontar's ***Drill Down Server*** platform, just as Framfab had done. Then Ford came along with its *Wingcast* concept bringing Qualcomm and Denso into the mix. Zeros just kept piling onto Telcontar's valuation.

All of this background is to show that, contrary to what *The Economist* believes, deCarta is no 'start-up'.[6] The companies that worked with Telcontar/deCarta needed an Internet-based solution for calculating and presenting routes and displaying information on maps. The Drill Down Server along with deCarta's platform satisfied those needs. As soon as customers wanted something more, they built it themselves because if deCarta built it for them, deCarta owned it, and all of its clients had access to it. Many of deCarta's customers could have bought the company. Google certainly could have done so in 2004 instead of acquiring Where 2 Technologies. Either deCarta's asking price was too high or it just was not interested in selling.

Uber can and will use everything deCarta has in its arsenal, but what Uber really needs is a big data analytics machine. As I have said (see ***The Dispatcher***, 11 January 2015), Uber's future value to its investors is based on much more than being an upstart taxi service broker, matching riders with drivers. It has managed to dodge every bullet fired at it so far, from angry taxi customers and their drivers to city authorities. It will more than likely survive a direct hit by its own drivers—initially in San Francisco, but depending on the verdict, it could be global—who are suing it to become employees rather than contractors. If it can closely monitor the cost side as well as it has managed the income side, it will be able to modify its business model to have employee drivers, at least until its cars drive themselves. For this, and for its future business as a super valet service, it needs a real-time map processing

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The Last Word on EU eCall!?

On Tuesday, 28 April 2015, the European Parliament voted in favour of fitting all new type approved vehicles with EU-authorized emergency call devices as of 31 March 2018. These devices will automatically alert the local public safety answering points (PSAPs) or Third Party Service Providers (TPSPs) in case of a crash. Before passing the measure into law, the Members of the EU Parliament strengthened the data protection clause to ensure that cars equipped with the eCall devices could not be tracked before an accident occurs. Further, the rule states that data gathered by emergency centers, whether PSAPs or TPSPs, must not be transferred to third parties without the explicit consent of the car owner, and car OEMs must ensure that the on-board system and software design permits the full and permanent deletion of data gathered. Within three years following the implementation of the ruling, the European Commission will provide a report to the Parliament advising whether buses, trucks or other vehicles shall be fitted with the devices.

Is this the end of this long saga, or is it just the beginning of the end? The devices are only one of the two hands clapping. The other is the installation of the PSAP infrastructure, and both of them are needed to applaud the successful introduction of eCall—unless all of the car manufacturers simply decide to install telematics devices in all of their cars with their own emergency call centers. I know which option I want in my car.

deCarta is no 'start-up' (Continued from P.3)

platform so it knows exactly where its drivers, its customers and its customers' pick-up and drop-off points are in real time. It needs to be able to map and store the routes its customers take, especially the stops they make along the way, so that its cars—with or without drivers—will be able to take on chores for customers when those customers are not in its cars.

What happens to deCarta and all of its current customers? Uber is not buying deCarta for its customers; it is buying it for its platform. deCarta's customers will have to find other options. We can say *So long, deCarta, and thanks for all the maps*.[7] You have done a great job during the past twenty years to push the Internet mapping ball forward. Help the upstart.

The Future of Vehicle Navigation (Continued from P.2)

mentions. Harman received a vote as the solution chosen by the top Premium OEMs with the highest demands for features and quality. Trimble's CoPilot got a vote as well.

In the early days of navigation, software and hardware were one; you couldn't have one without the other. Decoupling the two offered advantages to the OEMs in sourcing and pricing, but there were initially performance compromises. Elektrobit was among the first to offer a software-only solution. TomTom was first to offer a super low-cost embedded solution when it ported its software to other hardware. Nevertheless, I was a bit surprised that Bosch and Harman were the only hardware companies mentioned. For my money, Melco (Mitsubishi Electric Company) was one of the best all-in-one systems, and it is still among the top for navigation and traffic information software.

On question #3, the strong consensus was that off-board navigation would complement embedded systems, not replace them. "It will be a combination of on-board, stand-alone navigation without connectivity and enriched functions when connectivity is available. As simple as that!" Another said: "It will migrate towards a hybrid solution. Cost for memory is decreasing faster than mobile data communication and maps will be needed on board but not the full global detailed map. However, there was unanimous acceptance that 'brought-in' navigation (i.e. Google, Apple, Here and TomTom) had already made significant inroads and would only improve, reducing the gaps one by one between the two options.

Navigation systems have become much more than route calculation and display machines. One respondent said: "Envision a world where navigation is relegated to 'when needed'." The rest of the time, various functions will deliver information that is needed without requiring a pre-planned route. There were a few voices for the hybrid concept, with some functions running on the embedded system and others off a remote server. "The Google 'hybrid' approach allowing users to store frequently used map regions on board while the base solution is off-board makes sense to me," said one respondent.

The group was evenly split between Google and Apple on the questions of who is the best off-board provider today. Apple had a rough start with its botched map integration, but it seems to be making up ground. On a recent twelve-hour drive between Boston, MA (USA) and Blackville, New Brunswick (Canada)—you guessed correctly if you said 'fishing trip'— we hit a stretch of road that was new to the four of us in the ten-year-old, non-nav system Suburban. All four of us pulled out our phones, two iPhones and two Androids. Guess which one had the update. Right. Neither. We still have a way to go. More work for us.

Parking in Cities: Time for Phase Three

MOST OF US HAVE OUR NIGHTMARE STORY of parking rage. Here's mine. The meter-man in my Cambridge, Mass. neighbourhood was shot by an irate resident who finally had gotten fed up with receiving 'quota tickets'. All of us with valid resident parking stickers got them. At least in Cambridge in the late 1970s, when a parking guard had not handed out enough valid tickets to fill his or her quota, it was time to write tickets to those who had actually parked legally. We simply sent in a form letter with the ticket to City Hall and that was that. I guess our neighbour didn't learn the drill. The meter-man didn't die, and he was back on his beat six months later with a much more muscular build and a distinct determination in his gait. We never knew who the perp was.

Anyone who lives in a city and does not have access to off-street parking understands the difficulties of finding a parking space close to one's apartment, and the stress that this exercise adds to one's life. Even if you locate a space right in front of your door and don't need your car on a daily basis, weekly street cleaning, snow removal and rules that govern work hour parking eventually force a move, and then the stress starts all over again. In some cities, like Stockholm (see graphic), just figuring out whether a space is actually legal or not is a puzzle that is not easy to solve. And then there is the ever-present fear of vandalism.

Some people eventually run out of patience and seek the comfort of their own off-street parking space at whatever the cost---or they just move to the suburbs where a parking space is part of the apartment, condo or house.

A parking mobile app that is going to be truly valued by a user needs to address all of these stress factors: locating a legal and safe parking space; paying the correct fee for the desired amount of time; given a warning that the car must be moved and locating a new, legal space.

I won't keep you in suspense. Such an application does not exist for on-street parking. A few companies have ventured into this space. *MonkeyParking* (See ***The Dispatcher***, 4 September 2014) thought they had the solution to finding a space until they received a cease and desist order to stop trying to sell on-street parking spaces. They changed their app and now match driveway owners (sic) to parkers in San Francisco.

City Parking 1.0 made it very easy for parkers. There were parking meters for legal parking spaces: no meter, no parking. Period. ***City Parking 2.0*** made it easy for everyone except the parkers. You parked somewhere, paid for a ticket at a machine (once you found one that worked), placed the ticket on your dashboard and hoped for the best. ***City Parking 3.0*** is no on-street parking. One side of the street is reserved for two lanes of bicycles and separated from both the sidewalk and street with barriers. The other side of the street is reserved for drop-offs. Cameras ensure that a car that has been left is towed immediately. The remaining lane or lanes are for cars, buses and self-driving personal transit.

What do we do with the cars? What we should have done with them if someone was thinking about it when the number of cars began to equal the number of people in cities: put them in parking lots for residents only. The worst decision that was made by some cities was to limit the number of parking garage spaces under new buildings in order to promote use of public transit. Those parking spaces could have been used by residents during the nights and commuters and shoppers during the days. Commuter transit may have improved, but it did nothing to help residents with bus lanes and cycle paths on all streets. By the time this policy starts to take hold, autonomous vehicles will be on the streets picking up passengers in the parking lots and dropping them off at their doors. This can work-see Via Roma.

I took my Swedish driver's license fifteen years ago. As a non-EU citizen, I could not just hand in my Florida (last state where we lived before moving to Sweden) license and receive a Swedish one. I had to go through the complete process. After failing the test in English, I decided that I would have a better chance to answer the ridiculously difficult questions in Swedish. Hence the four-year process.

One of the most difficult set of questions relate to Swedish road signs, and the most difficult of them all are those for parking. The one under the large **P** *in the illustration above is a good example. You can park if you pay a fee on a weekday (Monday to Friday) between 8 a.m. and 6 p.m. On Saturday or the day before a holiday, you have to pay a fee between 8 a.m. and 3 p.m. On Sunday or any holiday, you have to pay a fee between 8 a.m. and noon. The rest of the time, you can park without paying a fee, unless there are other signs for loading, handicapped, diplomats and most of all, street cleaning! Most folks just park and pray, and then usually pay.*

This is the Via Roma in Turin, Italy taken by the author on 21 May 2015 at 19.45. The lane where there is a riding cyclist is also used by cars. The lane along the street, market with the yellow lines, is for deliveries. Street furniture is used and the overall effect is peaceful.

Michael L. Sena Consulting AB

Sundbyvägen 38
SE-64551
Strängnäs
Sweden

PHONE:
+46 733 961 341

FAX:
+46 152 155 00

E-MAIL:
ml.sena@mlscab.se

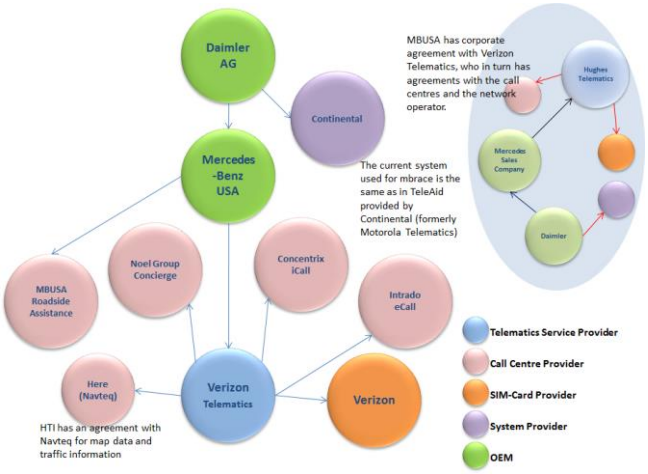
We're on the Web!

See us at:

www.michaellsena.com

Michael Sena works hard for his clients to bring clarity to an often opaque world of vehicle telematics. He has not just studied the technologies and analyzed the services. He has developed and implemented them. He has shaped visions and followed through to delivering them. This newsletter touches on the principal themes of the industry, highlighting what is happening. Explaining and understanding the how and why, and developing your own strategies for your organization, are what we do together.

What's happening at Verizon Telematics?



Verizon Telematics' Eco-system for Mercedes-Benz USA

Verizon Telematics, formerly known as Hughes Telematics, Inc. (HTI),[8] is a telematics service provider. It was founded in 2006 with a contract from then-DaimlerChrysler and funding from Apollo Investments, which owned the rights to the name Hughes. On 2 June 2012, Verizon Communications Inc. and Hughes Telematics, Inc. announced a merger agreement by which Verizon acquired HTI for $612.

In the autumn of 2009, the Mercedes-Benz **mbrace** system was launched in the US, and HTI began to deliver its first embedded telematics system services. The original idea was that it would deliver both the system and the services, and that both Chrysler and Mercedes-Benz would be the beneficiaries of both. The break-up of DaimlerChrysler in 2009 and the decision by MB to source its hardware from Continental, rather than from HTI, limited the scope of this initial contract. Added to this was the refusal of ATX[9] to relinquish the legacy customers to HTI reduced the number of initial customers by a considerable number. Nevertheless, at 10,000 new customers coming on line per month, it was a good start. VW of North America was added as an HTI customer in 2011 and services for Mercedes-Benz were launched in China in 2014.

Starting in the autumn of 2014, key staff began to leave Verizon Telematics. Jeff Leddy turned over CEO duties in January to Verizon veteran Andres Irlando. Chuck Link, CTO and one of the founders of HTI, left at the end of March. Keith Kammer, Senior VP and Keith Schneider, President of Networkfleet after it was acquired by HTI in 2006, and one of the two group presidents (Erik Goldman is the other) also left. Goldman and Kevin Link, another founder and General Manager of the company's China operations, remain. In Europe, Jürgen Daunis, account manager for the German OEMs, left for Ericsson in November and Theo –Han Jansen left for Jasper.

Is the new CEO shaking up the management in order to increase profitability, or are the original team members simply taking their leave after their post-sale contracts expire? Whatever the reason, that is a lot of talent walking out of the door.

Footnotes:

1. Navteq was acquired by Nokia in 2008 and is now called 'here'. Etak was acquired by Sony and then Tele Atlas, which merged with Geographic Data Technologies before being acquired by TomTom, also in 2008. The book value of the unit is about 2 billion euros, but Inderes Equity Research has valued it at 4.4 billion to 6.9 billion euros, based on a sum-of-parts calculation. HERE's sales in the first quarter rose 25 percent from a year ago to 261 million euros, and Nokia updated the full-year profitability outlook of the unit to an operating margin range of 9-12 percent from earlier 7-12 percent. On 21 May, Nokia CEO, Rajeev Suri, said the company was considering all options and needed more time to decide whether it made sense to spin out Here.

2. I was consulting to the AA, ARC and Volvo Cars in 1997. I witnessed first-hand GM's attempts to establish a foothold in Europe. Before and after Stan Sikorsky was the OnStar Europe GM, I met with him to discuss OnStar's direction and then misdirection.

3. On 20 May, it was announced that Continental would pay $678 million to buy Elektrobit Automotive, absorbing 1900 software engineers. This is the group that develops navigation software.

4. The principal network operators in the US do not have 100% coverage in those areas where there is a network unless they have roaming agreements with all of the 30+ local network operators. Nebraska, with a population of less than 2 million in a land area that is about the same as that of Germany, has a local carrier, Viaero Wireless, that is not on the top of the major carriers' lists. In other words, it can be a black hole.

5. FRAMFAB is a concatenation of two Swedish words, *framtids* and *fabrik*, which translate as 'future factory'.

5. *The Economist* called deCarta a 'start-up' in its little notice on the acquisition of the company by Uber. As Telcontar and then deCarta, the San Jose, CA-based company has been around for a couple of decades—hardly a 'start-up'.

7. With thanks to Douglas Adams and his fourth book in The Hitchhiker's Trilogy: *So Long, and Thanks for All the Fish* (1985).

8. The author was VP European Business Development for HTI from November 2008 until April 2011.

9. ATX began as Protection One, acquired Vodafone Tegaron, was itself acquired by Cross Country Automotive Group and the two renamed Agero, and then split off from Agero and acquired by Sirius/XM. ATX was the call center for the original MB system, called TeleAID. TeleAID was replaced by **mbrace**.