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1st Quarter 2014 Vol.2/Number 1

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THE INTERNET OF THINGS

by Paula Bernier

Happy New Year!

Hello. Welcome to M2M Evolution magazine 2014.

This represents the first issue of this publication's second year in production. And this year we're doing things a little differently.

As you'll notice if you visit the M2M Evolution magazine 2014 editorial calendar (available at http://www.m2mevolution.com/magazine/), each issue this year will revolve around a central theme. For this issue, the first quarter one, smart city and related topics are the theme.

The next issue will be all about retail applications, case studies, and technologies. For the third quarter issue, we'll tackle the subject of the Industrial Internet, looking at analytics, customer care and maintenance, platforms and telematics. And the fourth quarter issue will offer information and insights on what's happening around the more consumer-focused Internet of Things, including the digital home, health and wellness, and other wearable technologies.

Also new this year to M2M Evolution magazine are solution provider round ups with each issue. (Due to the timeline of this, the first issue, the 1q2014 round up will appear online only, so look for that at http://www.m2mevolution.com/magazine/.)

The roundups will essentially be like mini-buyers' guides. They will include the names and URLs of companies that offer solutions in a particular category, and then provide a brief write-up of what each company provides in that space. So, if you are looking for a solution or have an offering in one of the featured roundup categories, this is a resource to find what you're looking for or highlight what you can deliver.

Here are the roundup categories for M2M Evolution magazine in 2014:

- First quarter: smart grid/smart meters, parking applications, surveillance
- Second quarter: connected home products, retail applications
- Third quarter: health care applications, business intelligence, social machines
- Fourth quarter: connected vehicle apps, GPS solutions, telematics

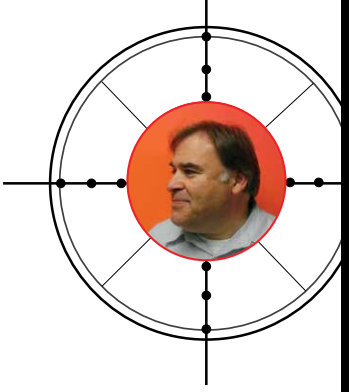
The M2M Evolution magazine team looks forward to bringing you, and working with you, to provide news, updates and analysis about where M2M is, where it's heading, and what we need to do to keep it moving forward. M2M Evolution magazine's distinguished advisory board, TMC CEO Rich Tehrani and myself, and our partners Carl Ford of Crossfire Media and James Brehm of Compass Intelligence will all continue to act as resources for our readership and the M2M industry, and we welcome you to contact us with comments and story ideas.

As I mentioned in the year-end feature in the last issue of the magazine, global M2M cellular connections are forecast to hit the 374.9 million mark by 2017, expanding at a compound annual growth rate of 26.5 percent from 91.4 million in 2011, according to research firm IHS. And Berg Insight forecasts that M2M devices with cellular connectivity will increase by 22 percent this year to reach 164.5 million in emerging markets, and estimates that M2M connections will grow at a CAGR of 24.4 percent with 489.9 million connections in 2018. Meanwhile, Analysys Mason says the M2M market will be worth $88 billion in the next 10 years.

To meet its potential, there's little doubt that M2M has to overcome some barriers. But there's been a good amount of forward momentum to date, and all signs point north. M2M

CAUGHT IN THE CROSSFIRE

by Carl Ford



There's No Such Thing as Too Many Cooks in the Kitchen

In your mind is there a distinction between the Internet of Things and machine-to-machine?

Robin Duke-Wooley of Beecham Research sees the Internet of Things as being consumer and machine-to-machine as being business.

The problem is that so many business processes are evolving to be supported on your smartphone that they look like they were made for the consumer. Likewise, the Internet of Things is becoming so good at analytics you can see business applications.

Often in talking with people about smart energy, the home and the building get interweaved even though there is a major difference in the way the solutions get implemented and level of capability available. Adding to the confusion is the fact that most of M2M utilizes SIM cards and accesses connectivity through a wireless carrier, while IoT often is not.

In the end, other than the scale of applications, I don't see much of a distinction. When I write about embedded systems in The Hot List, I only add to the confusion, because my discussion is more about the communities that are gathering around Arduino and Raspberry Pi. The systems are becoming the Heathkit/Erector Sets of future generations.

If you read Walter Isaacson's biography of Steve Jobs, you know that Steve as a child tinkered with electronic parts in the garages of neighbors. Through this community he met Steve Wozniak.

It is my sense that we are seeing the same kind of communities developing around do-it-yourself Arduino/Raspberry Pi Meetup groups. (I counted nearly 300 meetup groups with approximately 20,000 members in total.) On YouTube the search count combined is more than 1.7 million videos. Arduino and Raspberry Pi were boards developed to teach students how they can program and can be adapted to fit the imagination.

With Raspberry Pi and Arduino the story doesn't end with the hobbyists, because engineers are taking advantage of these solutions to deliver rapid prototyped solutions. Gemalto's concept board is a case in point where Arduino offers the flexibility to experiment. In addition to the ease of development comes the use of the cloud and APIs that support RESTful and JavaScript. JavaScript has become the lingua franca between client and cloud these days. This means that web developers are in a position to join the ranks of C developers with the same level of confidence and probably a leg up on user interface concerns.

In effect, what we have for $35 dollars is a Fully Programmable Gate Array. Going from concept to deployment out in the field is still going to be capital intensive, but real costs such as quality assurance are going to be greatly reduced.

Now my expectation is that much like the App Store, a lot of what gets produced will be self-indulgent solutions that don't work very well. Like George Bernard Shaw's insight that a "great author gives insight about humanity, a bad author gives insight about himself," we will see a lot of bad authors, but the impact of the quantity of authors is bound to deliver us a Shakespeare and perhaps a Steve or two. M2M

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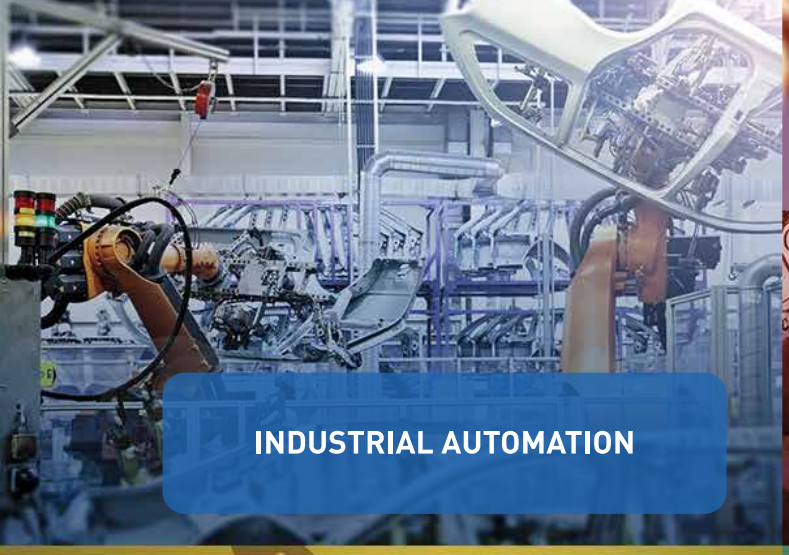

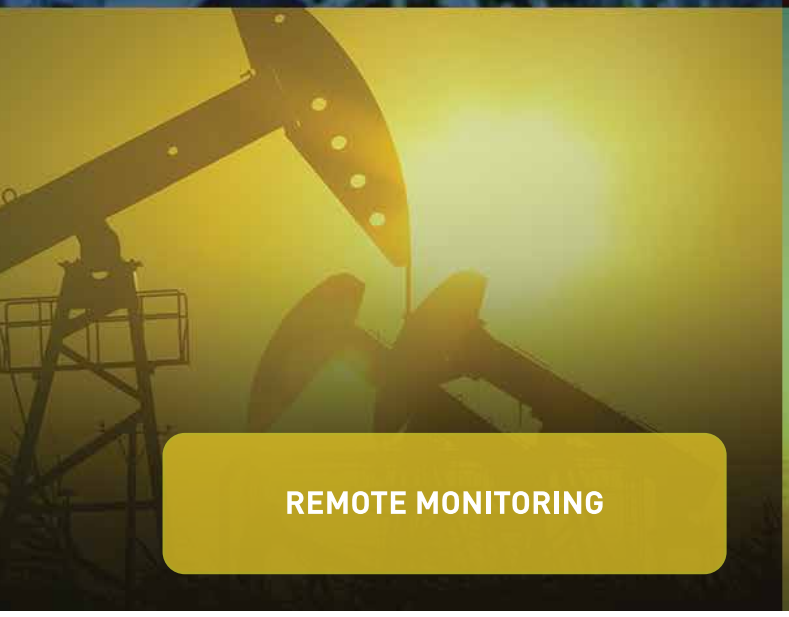

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by Erik Linask

CES Revs Up the Connected Car Space

A feature story further back in this issue talks about trends and activities in the connected car space. But I wanted to provide this late-breaking update on connected cars from the CES show I attended in early January.

Part of what made CES amazing was that it was the most like a car show of any event other than, well, a car show. There was the amazing Corvette Sting Ray, the wonderful BMW i3, the really cool Audi technology showcase, and the first commercially available self-driving car launched. Intel, NVIDIA and Qualcomm were well represented behind most of these launches, and the merging of consumer electronics and cool cars is clearly ongoing and what is resulting is amazing. Here are some highlights.

Corvette Sting Ray
OK. I saw this beautiful car and my mouth dropped open and my brain went into buy, buy, buy mode. This is just a pretty car, but what makes it amazing is it has a built-in race tracking system. This consists of a camera and intelligence that records your drive on a race track and then reports it back (when you aren't driving) like a review of a PlayStation or Xbox game.

This is like the best of both worlds: You get the feedback of a video game, and you get it from actually driving on a real racetrack. The car is pretty amazing too, decent power, an updated classic Stingray look, and an engine sound to die for. I saw this car at the preview and I was already drooling.

BMW i3
This Intel-backed car, I was all set to hate, until I drove it. You see I've driven a Tesla S and lusted after the i8 BMW electric hybrid, and the BMW i3 looked like a car for wimps. But you know what? After driving it, I actually think it is a better electric car than the others. It actually accelerated very quickly, handled decently and, here is the thing, it was small enough to park and you wouldn't worry about it. The thing about the Tesla is the car is huge and electrics are best in cities where there is a massive lack of huge parking spaces.

The i8 is not only big, but it looks like a supercar, which means you'll be sweating leaving it anyplace but your garage. The i3 is small, far more affordable, and because it is compact, it is far less likely to be dinged or damaged if you left it out at night. So it's actually a better solution and if you get a chance to drive one, you'll likely find it better than you thought. The only thing was the seats could use some work in the lumbar support area, as they were a tad uncomfortable.

Audi Tech Showcase
Audi was getting a lot of attention at the show thanks to help from NVIDIA and Qualcomm. NVIDIA does the graphics for the AV system in the car and the images are wonderful. It is like having a high-end tablet in the dash, and you really appreciate it in the car. NVIDIA was showcasing a future technology that I expect Audi to pick up which virtualizes the dash in such realism that you can't tell the metal isn't metal and the wood isn't wood, it is rendered.

This means at some future point you'll be able to select between a dash that looks like it came out of a classic car, a car of the future, or, for me, a steam punk car just by changing a setting. Wouldn't that be wonderful?

Qualcomm was demonstrating the connectivity side of the car and showcasing how a connected car could provide much more up-to-date information, streaming music more seamlessly, and connecting folks' tablets to the Internet through the car's Wi-Fi system.

The World's First Commercial Self-Driving Car
Granted, you won't drive this to work, it is more for riding around a golf course or in Florida by folks older than I am. But it could be ideal for those who are too old to drive and who are too drunk to drive a golf cart. You know who you are. The Navia is from France and while it isn't the sexiest or fastest electric car, it is likely the smartest. And while it is really more like a shuttle, it starts us down a road where we can nap while driving. I'm pretty sure there are a ton of people already doing this, but at least with this car they won't end up in my trunk. M2M

Erik Linask is group editorial director for TMC, the parent company of M2M Evolution magazine. James Brehm of Compass Intelligence will return to the Navigating M2M column spot in our 2q2014 issue.

by Tony Rizzo

Is Wearable Technology for Real?

Here Are Some Answers for 2014

TMC recently held its West Coast Wearable Tech Conference and Expo in Los Angeles. Wearable tech is a nascent market, but it is one we believe could become the next $50 billion tech market.

Smartwatch makers are coming out of the woodwork. Apart from Apple, which will launch an iWatch if and only if it feels comfortable that it can also deliver an ecosystem around it that goes beyond simply providing a second smartphone screen and related smartphone functionality, we will see smartwatches emerge in all shapes and sizes. Many of these emerging companies will find themselves boxed in with nowhere to really go, though keep an eye out on VEA-Design and its Buddy Watch (launching at the 2014 Consumer Electronics Show).

We suspect Samsung and Sony (both of them with new Android-driven versions of their current watches launching either at CES or the upcoming Mobile World Congress in February 2014) will be similarly boxed in, with smartwatches that most of us are likely not to consider all that necessary. Samsung will likely show off an entirely new generation of flexible screens, one of which may find its way to a smartwatch. But, flexible screens within the context of overall mobile devices is the big news here; any wearable tech derivatives will be incidental. LG gets our vote as most likely to show a truly flexible screen smartwatch (albeit most likely as a concept).

Meanwhile, the device that most clearly defines wearable tech for consumers at this point in time – the fitness activity tracker – will begin to find itself arriving at a crossroads of sorts. For ideas on where this market might go next keep an eye out on what Misfit Wearables is up to.

For the more serious fitness buffs among us, smart clothing may be the better way to go. Clothing+, Hexoskin and the emerging OMSignal are companies to watch in this space in 2014. For runners, of course, there is the new adidas Smart Run watch (yes, it tells the time but it isn't a smartwatch – it is a serious training tool).

Google Glass will ship this year. No doubt once it ships a lot of people will buy it. But we're also convinced that for most people who do buy it, it will in short order simply become their next great shelf ornament. Pivothead and Vuzix, on the other hand, may very well be on the right track to more useful smart glasses devices – especially within the enterprise (but keep in mind that a football team is an enterprise – we're not simply talking about evolving the shop floor).

Look for wearable tech to become huge in the medical and professional health care industries in 2014. Here both Google Glass and Epson America (with its Moverio smart glasses) are already making inroads and working with health care providers to create truly industry-changing technology.

Those WT companies looking to the enterprise and health care, of course, will be able to demand top dollar for their products. The value and productivity that WT brings to these environments is quite high, and prices will reflect this. Vuzix, for example, can demand $999 for its M100s when positioned for enterprise use. In the consumer space, they likely wouldn't sell for anything more than $299 (a cost point we anticipate Google Glass eventually dropping to). Interestingly, today, as we write, news is out that Google is now about to begin selling the latest version of Glass to certain subscribers of its All Access music subscription service. All well and good, but the display glasses are still priced at $1,500 – a foolish expense for essentially any non-developer.

Look for wearable tech to become huge in the medical and professional health care industries in 2014.

The entertainment industry also is heavily moving into wearable tech. And fashion will become intimately related with WT. This will become very real in 2014. The former CEO of Burberry and the former head designer of Yves St. Laurent are at Apple now.

If you are in the WT business, want to be in the business, or are now moving to develop business relationships with those who already are, we look forward to seeing you in New York City July 23 and 24, when our next WT conference and Expo takes place. M2M

Tony Rizzo is senior editor at TMCnet, the online entity of M2M Evolution parent TMC.

Mobeen Khan

A Word from the Advisory Board
In this, the fifth issue of M2M Evolution magazine, we'd again like to recognize our advisory board. All advisory board members are listed on our masthead. But on the following pages we'll hear from a subset of these experts.

There's a Bright Future Ahead for Connected Machines

Over the past 12 months, we've watched M2M solutions impact the marketplace across a variety of industries. With large and small companies constantly looking for a competitive edge, technology providers are continuing to invest in developing capabilities that can offer businesses an advantage. It's no secret that we're witnessing an exciting time for M2M and that the best is yet to come. As we reflect back on the tremendous progress made in 2013, here are some M2M market predictions for 2014.

Developers Get Engaged
When smartphones first arrived on the scene, software developers started building ecosystems of mobile applications for businesses. Although we've made significant strides in the M2M space over the last decade, we are only at the beginning stages of developing applications and systems for connected machines. Niche developers working in laboratories and innovation centers all over the world are now focused on enhancing specific components of M2M solutions. As more mainstream development environments and models start to include M2M capabilities, we will see even more developers start to experiment with M2M applications.

M2M Solution Stack Growing in all Directions
Today a large number of vertically integrated platform models support M2M applications. As these stacks mature, we will not only begin to see more transparent layers, but also more M2M developers focused on enhancing specific layers. For example, technology experts in equipment, data, and device security layers, as well as providers of device authentication solutions, are already establishing their proficiency in these particular areas. As a result, specialized and vertical-oriented solutions will start to emerge in areas like worker safety and water management.

M2M Applications Start Telling Us More
Businesses adopting M2M technology are starting to depend on M2M applications to provide information that can be used to make strategic decisions. Given that M2M developers are building more intelligent machines everyday, we are likely to see more applications per deployment. A great example of such dependence is in the heavy equipment space. For instance, a heavy-machine operator that today uses M2M to track the location of a machine will tomorrow start to record alarm and usage data through the same or a new application.

Security is Essential for M2M Deployments
For a long time, companies have viewed a return on investment as the most important need when implementing M2M solutions across their businesses. Now, however, we are starting to see an increased focus on data security. When you think about a large deployment of connected machines and the amount of data they can produce, the need for security becomes a key company priority. As we move forward in M2M, we can expect enterprises to go the extra mile to protect their intelligent machines and the data they produce.

Businesses Dive Deeper into Analytics
Decision-makers within a company are always looking for ways to cut costs and increase efficiency. In addition to M2M data security as an emerging area of emphasis, we will also see companies seeking to enhance their ability to analyze and utilize the new data M2M gives them. Customers that marvel at the amount of data collected from machines are slowly realizing that the true benefits come from the type of data that is extracted and the uses they make of it. We anticipate that enterprises will want to take a deeper look at how information can help them make critical decisions to improve how they manage their businesses.

With M2M technology growing at such a rapid pace, we're able to recognize how connected machines can provide capabilities to businesses across a number of different verticals. Our 2014 predictions illustrate not only how far we've come in the M2M space, but where we are headed next and how quickly we can get there. M2M

Mobeen Khan is executive director of product marketing for advanced mobility solutions at AT&T Business Solutions (www.att.com).

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Ken Hosac

Visa, MasterCard or AmEx?

Credit Cards in the World of M2M

Point-of-sale businesses are paranoid, with good reason, about protecting sensitive customer and company information. Financial institutions require that any company that stores, processes or transmits credit card information complies with the Payment Card Industry, Data Security Standards.

Companies that fail to comply are subject to fines, lawsuits, and can even be banned from processing credit cards. Even worse, companies that are breached can find themselves in the news headlines, significantly impacting goodwill with customers, partners and shareholders.

How Do Breaches Occur?

Most breaches occur through security deficiencies that are discovered and exploited by remote high-tech hackers. The remote outside jobs are often done by thieves who first scan the Internet looking for vulnerable systems, including misconfigured firewalls, lightly-defended remote admin access, weak or default passwords, or known software vulnerabilities. Once a vulnerable system is found, they then use exploit toolkits to crack into the systems and install malware or keystroke loggers to capture the data. The inside jobs are often done using credit card skimmers, malware or keystroke logging software installed in POS systems or networking equipment.

What Does this Have to Do with M2M?

High-tech thieves often target POS devices and systems that are attached to the Internet. They don't care if it's a POS device in store, a retail kiosk, or a fare-payment system on a bus. If it processes or stores a credit card, it's a target.

The fasted-growing sector of M2M involves machines talking to other machines over 3G/4G wireless networks. Retail stores and restaurants are increasingly using 4G as a failover network connection for their POS devices. Retail kiosks use 4G as a primary network connection for processing credit card transaction. Seasonal pop-up stores use 4G as a temporary network connection during the holiday season. Buses and taxis use 4G as a network connection for processing credit cards for fares.

Security solutions and procedures need to address both the network equipment (i.e., M2M router, enterprise router, etc.) as well as the systems and end devices that attach to the networking equipment (via Ethernet, Wi-Fi, serial, or other connections).

PCI Compliance

The PCI Standards Security Council was founded by AmEx, Discovery, JCB, MasterCard and Visa, and consists of hundreds of industry participants that have a vested interest in reducing vulnerabilities in the card-processing ecosystem. Its sole objective is to protect cardholder data. PCI compliance is achieved when the merchant successfully demonstrates (via external audits or self-certification) that its entire system and process complies with the 12 requirements of the PCI DSS.

High-Level Requirements

The twelve high-level requirements for PCI DSS 3.0 are fairly straightforward: 1) Install and maintain a firewall. 2) Don't use vendor-supplied default passwords or accounts. 3) Protect stored cardholder data. 4) Encrypt transmitted cardholder data. 5) Protect all systems against malware. 6) Secure all systems and applications. 7) Restrict access to cardholder data. 8) Authenticate access to system components. 9) Restrict physical access to cardholder data. 10) Monitor all access to networks and cardholder data. 11) Regularly test security systems. 12) Maintain information security policies that addresses all personnel.

The devil is in the details. Each of these high-level requirements translates into detailed sub-requirements and audit procedures that have been developed over years of iteration.

New Changes in Version 3.0

Version 3.0 of the PCI DSS was released on Nov. 7, 2013, and consists of three major themes. First, the updated specification represents a philosophical shift from "quarterly or annual audit-based compliance" to "business-as-usual processes with 24x7 monitoring". Second, the new requirements add specific testing procedures to clarify what validation is expected for each requirement. There were wide variations in how auditors applied the previous requirements, and new version seeks to minimize these differences to drive more consistency in the validation process. Third, the new requirements represent an evolution of the process based on experience, with several updates to address specific gaps as well as new and emerging threats. M2M

Ken Hosac is vice president of business development at CradlePoint (www.cradlepoint.com).

Matt Jennings

Reducing the Complexities of M2M

The machines that organizations use today have a lot to say. And if they were plugged into the enterprise in a way that businesses could understand, the possibilities would be endless. Fortunately, machine-to-machine technology is now making this a reality by allowing organizations to gather data from the edge of the enterprise and apply it in ways that impact the business. Because sensor, gateway, battery, cloud and cellular network technologies are key enablers of M2M solutions, M2M has a perceived "stack of complexity." I am currently on the board of the International M2M Council, an organization focused on reducing this perceived complexity in order to get more M2M solutions implemented.

Barrier to Entry Lower Than Ever

Recent improvements in network technologies have reduced the complexity of implementing a solution and made the barrier to entry lower than ever before. Ten years ago, sensors were the size of a hockey puck, cost as much as $300, were connected via landline, if at all, and had limited battery life. Today, sensors are generally the size of a nickel, wireless, offer greater functionality and cost a tenth of their previous price. Today's gateways also optimize battery life because they allow users to transmit data only when necessary – not continuously. Similarly, batteries have become smaller and offer longer life in more challenging environmental conditions such as colder, warmer and moisture-rich environments. Cellular technology has also improved and because organizations are optimizing business applications, cellular network cost is decreasing.

Cloud computing platforms have become more robust, more scalable and less expensive, enabling greater adoption of M2M technologies and the Internet of Things. Cloud environments, like Device Cloud by Etherios, provide the infrastructure required to access, control, configure and upgrade unlimited devices securely over the Internet. With greater data storage and data analysis capabilities, organizations can lessen the complexity and maximize the return on investment of their M2M technology deployments.

Machine-to-Business: Connect, Control and Engage

At Etherios, a division of Digi International, we like to use the term M2B, or Machine-to-Business, because M2M doesn't fully capture the technology's value. M2B is about much more than connecting machines to machines. It is about business transformation and driving amazing efficiency into an organization's process. We follow a "Connect, Control and Engage" model for our M2B solutions: seamlessly connect devices (via wireless hardware); gather, integrate and manage device data (via Device Cloud); and give those devices a voice by integrating device data into enterprise applications and processes (via The Social Machine).

For example, we recently helped a remote tank level monitoring system provider migrate from a traditional hardware-based business to a service oriented business. By providing wireless connectivity to previously isolated tank sensors, we are enabling the company to manage the health and connectivity of devices at their customer locations. Proactive monitoring and integrating device data into the enterprise enables preventative maintenance, reduces downtime and opens up new revenue streams through service offerings.

Here's how this works. When a battery inside a sensor is about to die, an alert is triggered through The Social Machine, a cloud-based solution that integrates with salesforce.com to connect products into an organization's business processes. A work flow begins which identifies the issue, alerts the proper personnel, and creates a call to action for their customer. The customer is notified of the issue within minutes. A new battery is deployed the same day so no level readings are missed and any costly overflow situations are avoided.

The Time Is Now

Whether you call it M2M, M2B or The Internet of Things, now is the time to start listening to what your devices have to say. Cost and complexity are decreasing as more and more companies realize the transformative value of connecting their machines to the enterprise. M2M

Matt Jennings is vice president of business development at Digi International (digi.com).

ADVISORY BOARD

Alex Brisbourne

Satellites in M2M – Creating Seamless Global Connectivity

The demand for satellite services is on the rise thanks to global connectivity requirements from a broader range of M2M applications and since more than 90 percent of the globe does not have cellular coverage despite the fact that many industries and infrastructures are located in these areas.

Satellite hardware has historically seen limited deployments to very specialized use-cases due to bulky form factors and pricing. But today, devices are only slightly larger than cellular devices and can scale to 3G equivalent performance at rates comparable to cellular in many instances. Additionally, satellite connectivity can offer an attractive complement to more traditional cellular and even Wi-Fi-based connectivity, as M2M application providers and their customers have seen remote monitoring and control transition from a nice to have feature to a mission critical 24x7 global requirement. This always-on connectivity trend is making satellite an integral part of M2M applications and their successful deployments.

There are a variety of factors helping to drive satellite adoption including business operations and regulatory requirements; improvement in business operating efficiencies gained from deploying M2M; additional revenue streams enabled by adding M2M applications to a company's portfolio; and cost reduction on both the hardware and networking components required to successfully deploy and manage an M2M solution. Technology advancements now offer the capability to deliver larger data payloads and decreased latency than what has been historically available.

Satellite services, on a basic level, offer greater ease of operation, a more comprehensive pricing structure, higher levels of security, and increased reliability of service.

Satellite connectivity also provides a longer lifespan for M2M devices and technologies – companies don't have to worry about frequency shifting, i.e.: 2G to 3G, and can expect more stability among the underlying operators in the satellite market. However, there are certainly industries where cellular services make more sense than satellite and vice versa. Some industries where satellite services excel are:

- **Oil and gas** – Due to the dispersed nature of the oil & gas industry, such as oil rigs in the middle of the ocean or desert, satellite is necessary to provide data service even in the most remote locations.

- **Mining** – When drilling into the depths of the earth, it's important to have a strong satellite signal where cellular towers don't always exist.

- **Maritime** – This is an application for which ships and vessels must communicate location coordinates and have always-on communication with emergency and related personnel when far beyond the reach of cellular connectivity.

- **Environmental monitoring, agriculture and irrigation** – Similar to oil & gas, devices for environmental monitoring, agriculture, and irrigation are often operating in remote locations with little to no cellular service. It's imperative for companies to utilize satellite services or they risk loss of connectivity.

- **Industrial monitoring, grids, pipelines and highways** – This involves extracting data from non-IT devices to deliver data to critical monitoring systems – ensuring operations are running as intended and providing diagnostic reporting – especially in areas where cellular coverage is sparse or non-existent.

In addition to the markets above, satellite services are also used by M2M applications that monitor river flows, wastewater management, heavy equipment, and electrical generation and grid – just to name a few. Even certain telehealth devices that require always-on connectivity utilize a hybrid cellular and satellite approach. Think of critical mHealth monitoring for patients wishing to vacation aboard a cruise ship, for example.

Most importantly, satellite services enable business continuity. We live in an on-demand society, and M2M applications are no different. Some M2M applications need to be connected at all times without the worry of an outage or roaming costs, especially in the face of natural disasters. Satellite also opens up the market for dual-mode devices that can seamlessly switch between cellular and satellite connectivity based on an M2M device's specific location. By bringing devices and applications under one global, reliable umbrella, satellite services are working to create a truly connected planet.

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Alex Brisbourne is president and COO of KORE (www.koretelematics).

by Paula Bernier

Platform for Change

New Leaders Position Multi-Tech for Innovation, Responsiveness, Growth

The manufacturing floor at Multi-Tech Systems Inc. was buzzing like Santa's workshop in December. That was the message conveyed by CEO Rod Landers in an interview with M2M Evolution magazine just before the holidays. OK, he didn't say it quite that way, but you get the picture.

The point is that Multi-Tech Systems is on a roll after installing new management, which Landers said is returning the company to a culture of innovation, agility, and customer service.

"Multi-Tech is back, and we're going to make some things happen in 2014," he said.

The People

Multi-Tech Systems invited Landers to join the board a few quarters ago in an effort to expand its industry knowledge mindshare. Landers founded Spectrum Design Solutions, which is now part of Digi International, and has held senior-level positions at Digi, Logic Product Development, Motorola, and Safe Retrieve. The board liked the ideas Landers brought to the table and asked him to step in as CEO.

"The company was headed in a direction of trying to do full solution selling, and it was difficult to institutionalize that," said Landers. "I said 'what we are is a good platform on which customers can create their own solutions.' The board really liked that message, but previous management was having a hard time swallowing that."

The installation of Landers as Multi-Tech Systems' new CEO was publicly announced Nov. 4, and he quickly got to work reconfiguring the Multi-Tech management team.

Scott Wilken was brought in as CTO. Landers' former supervisor at Logic Product Development, Wilken comes from a rapid design culture, so was tapped to help Multi-Tech with its speed and efficiency.

Top management also includes existing executives who have recently been elevated to the C suite. That includes 30-year Multi-Tech veteran Del Palacheck, who had been vice president of manufacturing, and was recently promoted to COO, and new CFO Bruce Richardson, who had been vice president of finance. Landers explained that Palacheck holds an MBA, is good with numbers, and has been in manufacturing his entire professional life, so he's very tied into that community. As vice president of manufacturing, Palacheck's group was very efficient, Landers noted, with a better than 99 percent success rate on the floor. As for Richardson, Landers said he's

QuickCarrier USB-D M2M quality USB cellular dongle/modem

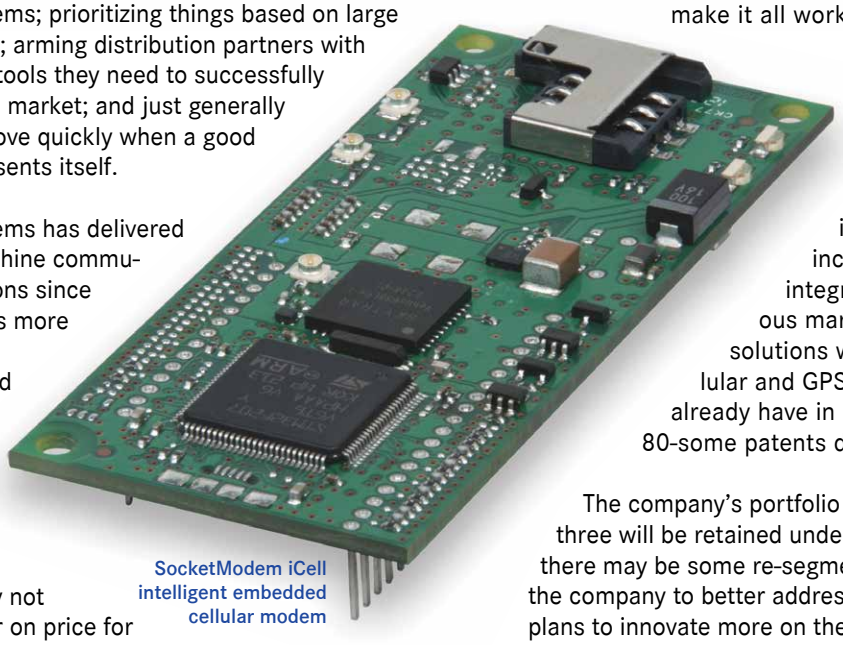
been capable in addressing cash strategy and effectively had been performing as CFO even before being given the title.

As for the Multi-Tech Systems staff at large, the company is working to better configure its existing 200 employees so they are positioned to innovate. That includes putting together an advanced product team. The company also plans to add new employees to support its initiatives in the U.S., and in the Asia Pacific (where it will make a big push in 2015) and EMEA ("hitting Europe hard in 2014") regions. Landers was not ready to disclose further hiring details as of press time.

The Positioning

Privately owned Multi-Tech Systems has already seen improvements, including exceeding financial projections, in the short time since Landers has taken the reins. Landers chalks that up to making it easier for customers to do business with Multi-Tech Systems; prioritizing things based on large customer needs; arming distribution partners with the pricing and tools they need to successfully bring product to market; and just generally being able to move quickly when a good opportunity presents itself.

Multi-Tech Systems has delivered machine-to-machine communications solutions since 1970 and boasts more than 22 million devices deployed worldwide. But the company in recent years had been losing some opportunities by not coming together on price for customers, Landers explained, adding in some cases the gap between seller and would-be buyer was very thin, sometimes a difference of just 2 percent. Landers is working to correct that situation by analyzing customer relationships and being more flexible for those businesses seen as probable long-term customers.



SocketModem iCell intelligent embedded cellular modem

"You don't make all your money on one deal. You help customers, and they generally come back again and again and again," noted Landers. "This is nothing but Business 101."

The company is also positioning to be more nimble in responding to new opportunities. Here's an example of how Multi-Tech Systems did just that.

ARM Ltd. recently called on Multi-Tech Systems to ask for its assistance in creating a platform for the AT&T Hackathon taking place just before CES in Las Vegas. The microprocessor company tapped Multi-Tech because it has pre-certified modules, and the company was concerned about getting its solution together in time for the early January event. The request was made in November, during his second week on the job, said Landers, and Multi-Tech Systems hit the deadline, which was the end of December.

With this work, ARM was able to deliver a solution, which leverages the technology of several partners, to show what can be done on top of ARM's Embedded platform, for this show at the scale it needed, Landers explained. And rather than simply providing its typical products as part of the effort, Landers added, Multi-Tech Systems made the extra effort to look outwardly and call on its own partners to make it all work.

The Product

Multi-Tech Systems has long had a focus on helping customers achieve the shortest path to M2M connectivity. It works with clients, which include both end user customers, integrators and large OEMs, in various markets to wirelessly-enable their solutions with analog, Bluetooth, cellular and GPS connectivity. What it doesn't already have in its portfolio it can design, as its 80-some patents demonstrate.

The company's portfolio includes three product lines. All three will be retained under the leadership of Landers, but there may be some re-segmentation of products to enable the company to better address user needs. The company also plans to innovate more on the broadband and wireless fronts.

Its family of unified communications solutions address fax and VoIP, and target IT types. For example, its FaxFinder is a collection of customer premises-based fax servers that do fax-to-IP conversion and allow faxes to be delivered as PDF or tiff files. Landers said Multi-Tech is working to innovate on this product line to make it more useful to users such as attorneys and those in the medical profession. Rather than doing analog-to-IP conversions, he said, this kind of solution could support environments with IP lines coming in and analog equipment on the premises.

Routers, modems and open communications gateways represent another product line at Multi-Tech Systems. Routers

address cellular and other transport. The Linux-based MultiConnect OCG gateways enable customers to put their own code in the box, and add capabilities via expansion cards, so they can pull in, analyze and issue reports about sensor data.

Then there's Multi-Tech's embedded product line, which includes a family of pre-certified SocketModems.

Asked what the company is offering in terms of products that are new and exciting, Landers points to the QuickCarrier USB-D, which the company bills as the industry's first true end-to-end M2M dongle. The consistency, reliability and upgradability of the QuickCarrier USB-D is important in M2M deployments, which can involve large numbers of unmanned devices. Other features of the QuickCarrier USB-D include AT command compatibility and pre-certification by major regulatory agencies, an internal antenna, short message service, Windows and Linux drivers, and support for 3G HSPA+ and EV-DO.

Landers said the cellular dongle is getting leverage from digital signage applications, as beginning in the first quarter of 2014 it will enable users to leverage it for remote management of multiple assets, such as a collection of digital signs.

Multi-Tech Systems is on a roll after installing new management.

The company's MultiConnect OCG gateways are also an exciting area of activity, added Landers, explaining they can now give users visibility into end devices, and populate end devices with new or updated capabilities and instructions. Later in 2014 Multi-Tech expects to launch a router running on OCG.

The Partners

Today more than half of Multi-Tech's products get to market through the company's distributors, which include such major names as Arrow, Avnet and Ingram Micro, among others. Between 10 and 20 percent are delivered by value-added resellers.

Multi-Tech refers to these companies as partners, but Landers said until recently the company has not always treated them as true partners. That's why Landers and his team have embarked on an effort to ask these companies about their goals and how Multi-Tech can help meet them.

"That's a big change," he said.

The Pivot

The new management and positioning at Multi-Tech Systems represent more of a pivot than a wholesale change, Landers said. But make no mistake about it, he said, they represent a change of course.

All of the above are efforts that Landers believes will enable Multi-Tech to innovate rather than simply compete with others in the M2M space; to grow outside the U.S.; and to provide a platform that is so easy to understand and use that it turns the industry on its head. Landers compares this product positioning to what Apple did with the iPhone and the App Store.

"I'm bringing back the innovation culture that used to be here when Multi-Tech System's founder Raghu Sharma was here." M2M

MultiConnect rCell intelligent wireless router

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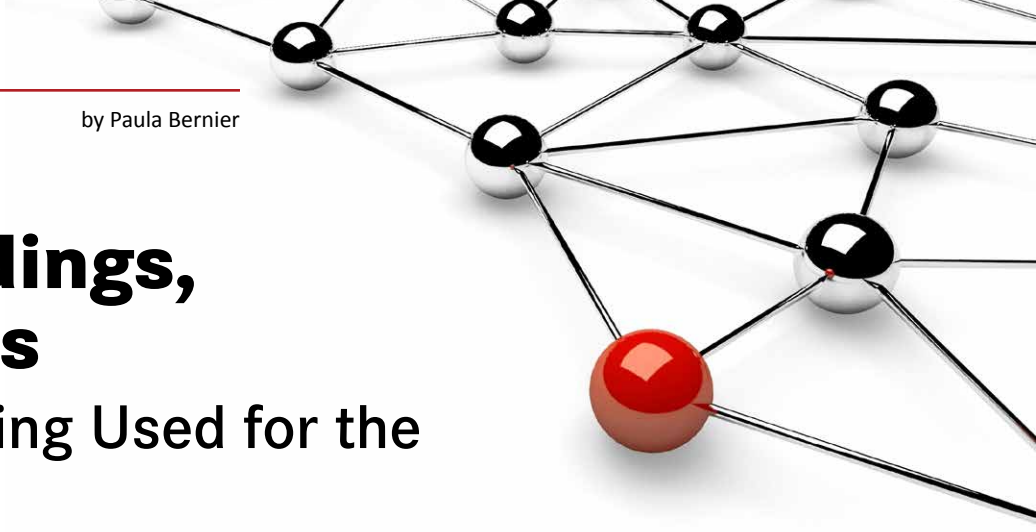
by Paula Bernier



Smart Buildings, Smart Cities

How M2M Is Being Used for the Greater Good

You've probably heard about how machine-to-machine technology is being used to connect trees in the Amazon Rain Forest, so officials can track them if they're illegally cut and removed. I came across a TMCnet article yesterday that talks about how sharks are being tagged in Western Australia so a Twitter message is automatically generated when those sharks are swimming near popular beaches. And a piece in M2M Evolution magazine at this time last year highlighted how European farmers are leveraging M2M to correctly time cow insemination and alert them when an animal is ready to give birth.

But this piece is not about how M2M is being used in exotic destinations or rural locales. Rather, this piece addresses how M2M is and can be used by city folk to make buildings, parking, transportation, and many other potentially problematic facets of urban life more efficient.

The Big Picture

Given the fact that large cities already contain the bulk of the U.S. population and that cities contribute the majority of GDP growth to our country, leveraging connected technology to maintain and improve quality of life and energy efficiency is already important. And it's going to be more important still going forward considering the urban growth happening in key markets across the globe.

Eighty percent of the U.S. population lives in large cities, according to the April 2012 study "Urban America: US Cities in the Global Economy," by McKinsey Global Institute. Almost 85 percent of U.S. GDP was generated by 259 large cities in 2010, Kinsey says, and more than 10 percent of global GDP growth to 2025 will come from large U.S. cities.

"Large cities in the United States – and in particular the nation's broad switch of dynamic middleweights – dominate the economy as in no other region of the world," according to McKinsey.

Meanwhile, Asia – and China in particular – are seeing a massive migration from rural to urban areas.

"China's economic transformation is happening on 100 times the scale of the first country in the world to urbanize – the United Kingdom – and in just one-tenth of the time," writes McKinsey. "By 2025, the number of urbanites in China will be triple the number in the United States."

Sudden urban development in China, which intentionally flooded many rural areas and ancient buildings to create the enormous power source known as the Three Gorges Dam to support the growing economy, has created a lot of problems – and not only because the dam displaced a huge number of people and scientists believe it is a potential new source of earthquakes. Concentrating people, a quickly growing number of cars, and businesses in city centers, as is widely understood, also is a recipe for disaster when it comes to pollution. And cities in China are reaching new highs – and not in a good way – on that front.

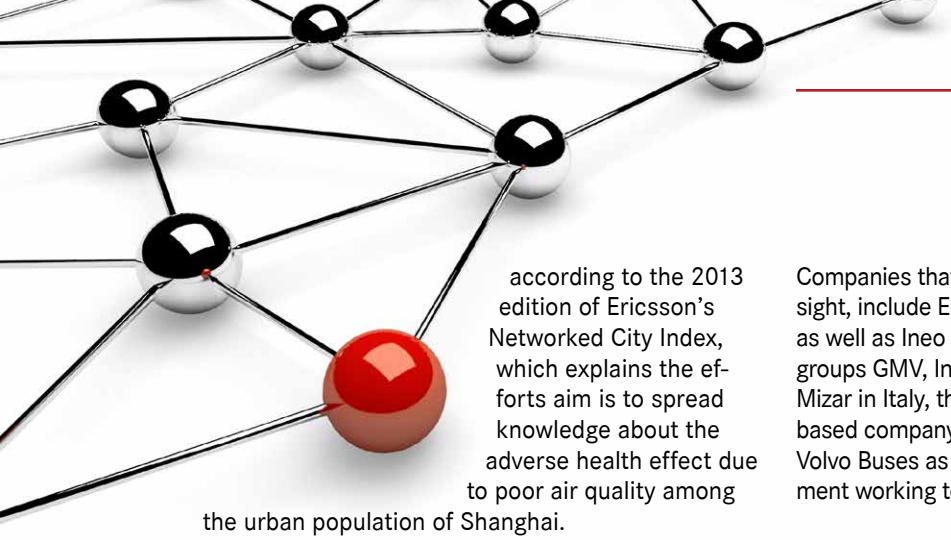
Pollution Management & Transportation

China's air pollution last year was the worst the country had seen in 52 years, as Forbes, among others, has recently reported. More than a dozen provinces saw record-high levels of air pollution, according to the report. Meanwhile, the Asian Development Bank reports that less than 1 percent of China's biggest cities meet World Health Organization guidelines.

The good news is that the Chinese government is apparently working to get a handle on the problem.

China has reportedly pledged to spend 1.7 trillion (around $279 billion) to improve the pollution situation there, with plans to reduce air emissions by 25 percent between 2012 and 2017. Meanwhile, as reported in a Dec. 10 story by The Washington Post, Gina McCarthy, the administrator of the U.S. Environment Protection Agency, just visited China to help the country address its pollution problem.

Shanghai's Environmental Protection Bureau already communicates daily air quality information via its website,



according to the 2013 edition of Ericsson's Networked City Index, which explains the efforts aim is to spread knowledge about the adverse health effect due to poor air quality among the urban population of Shanghai.

Patrik Regårdh, head of Ericsson's Networked Society Lab, notes that IT and communications solutions can enable "completely new ways for citizens to interact with their city and its environment... share information and more actively engage in dealing with every day issues."

And most Chinese cities already monitor traffic by employing roadway sensors and video cameras, reports Telematics Update, and share that data in real time via in-vehicle navigation systems and websites. Various Chinese cities are looking at how they might leverage for everyday use the kind of intelligent transportation alarm, priority, and routing systems used during the 2008 Beijing Olympics.

"I think the Chinese government should look into telematics solutions to help monitor, manage and eventually solve these air quality issues including another big topic – traffic congestion," blogged Ralf Hug of consulting company Trajectory Group. "If every car would have connectivity, many innovative telematics applications could be put to use and help with emission monitoring and excessive driving and traffic congestion."

Intelligent transport systems are already in use in such markets as Europe. The European ITS market was worth €0.94 billion ($1.3 billion) in 2012 and is expected to reach €1.44 billion (about $1.96 billion) by 2017, according to Berg Insight, which adds that fluctuating economic climates in most countries won't dampen these prospects given most projects are funded at least in part by public investments.

"The European market for public transport ITS is expected to develop favorably in the upcoming years, spurred by developments on both the national and EU level," said Rickard Andersson, senior analyst at Berg Insight.

Companies that are positioned to benefit, according to Berg Insight, include European ITS leaders INIT, IVU and Trapeze Group, as well as Ineo Systrans in France, Vix in the U.K., Spanish groups GMV, Indra and Grupo Etra, Swarco's subsidiary Swarco Mizar in Italy, the Norwegian provider FARA, and the Belgium-based company Prodata Mobility Systems. Meanwhile, Berg sites Volvo Buses as an important provider from the vehicle OEM segment working together with partner Consat Telematics.

Andersson added that smart city initiatives also are a major driver of ITS efforts and adds that open sharing of public transport data is a prerequisite to enable seamless multimodal, multi-operator and cross-border planning tools for travellers.

Smart Cities: Challenges and Benefits

Here, Andersson brings up the important point that aggregating and sharing data can be very beneficial to smart city efforts. But that's often not as simple as it sounds, even when only a single city is involved, said Nathalie Leboucher, head of Orange Business Services' Smart Cities strategic program.

That's because cities tend to work in silos, with schools separate from parking, for example, she points out, and a segmented or partial view of a city's needs can limit the scope and efficacy of M2M efforts, Leboucher said. For example, she explained, sometimes a lamp on a street can be outfitted with connectivity and leveraged for several city-related purposes.

A segmented or partial view of a city's needs can limit the scope and efficacy of M2M efforts.

But, increasingly, city planners are working to define IT strategies and priorities as a whole related to smart city efforts, she said, noting a recent poll of French cities helped them define traffic congestion, access to housing, and security and safety as their top challenges to be addressed with smart city strategies.

Even when cities are able to come together and define what they want to accomplish with smart city strategies, have suppliers that can educate them on how to meet those goals, and then come up with the budgets to move forward, changing governmental leadership can stop or delay these efforts, said Leboucher, who explained that Orange's smart city initiatives in several cities in France were on hold for six months before the pending election.

Education and individual design are also key elements of smart city projects, said Leboucher, who previously held

jobs in the transportation sector and was a city council member in France.

"You need to customize the solutions," she added. "It's really difficult to just copy one solutions from one city to another."

Yet for all the challenges of getting smart city initiatives moving forward, Leboucher said she believes these kind of things are the wave of the future.

"Two years ago I wasn't so optimistic," she told M2M Evolution magazine. "Now I'm really convinced it's going to be megatrend. Why? You get a lot of optimization, and you get a better quality of life."

Orange has been working with governmental and other organizations on a number of fronts related to smart city efforts.

It collaborated with the railway in France to Wi-Fi equip all its trains in advance of the liberation of railways there starting in 2019.

Also on the transportation front, Orange has been talking with a city in the Eastern part of France, among other locales, about acting as the prime contractor and connectivity provider for Streetline deployments. Orange has a memorandum of understanding in France with Streetline, a company which offers an application of the same name that uses sensor-enabled mobile and web applications to manage parking.

Orange also has created a joint venture with a French water utility, for which it already has deployed 700,000 smart meters in France. The turn up of a total of 5 million smart meters are on the agenda for this engagement.

Smart water projects are now rising up in many parts of the world, according to a recent TMCnet story, which notes that major companies involved in such activities are Acciona Agua of Spain, Thames Water from the United Kingdom, and Vitens of the Netherlands.

In the Acciona Agua project in Cáceres, Spain, for example, new technology is being placed in the city center and in the historic district that integrates remote meter reading, water quality sensors, a geographic information system, and mathematical modeling to detect faults, jams or leaks.

There are also several programs using connected technologies like M2M for more efficient desalination, wastewater treatment, and water usage elsewhere in Europe, in India, as well as in the Middle East. For example, the Saudi Arabian government is investing up to $53 billion between now and 2022 on a desalination and wastewater treatment effort.

Thinking Inside the Box

Smart home and smart building are another key area of focus for Leboucher's group at Orange. She explained that the idea is to improve existing buildings so they can operate more efficiently and more effectively welcome visitors. That may include how to better organize the reception area, or more efficiently heat and light conference rooms, she said.

Orange is also working on some greenfield opportunities in high growth areas such as the Middle East, where it has a contract with the King Abdullah Financial District in Riyadh, Saudi Arabia. This effort, in which Orange has been involved for three years so far, involves the creation of an entirely new financial district that is built from the ground up as a smart city. KAFD and Orange are in the midst of putting together a 10-year plan for the district, which will outline what capabilities and technologies will come into play, but it could include things like automated cars, digital signage, smart meters, and Wi-Fi for all. A similar effort is under way in Doha, Qatar, she said.

On a global scale, companies invested up to $5.5 billion in intelligent building systems in 2012, according to a recent TMCnet story by Joe Rizzo, who reports that IDC expects this space to see CAGR of 27.1 percent by 2017.

"The efficiency of smart building management technology was recently demonstrated by Procter & Gamble," added Rizzo. "It conducted a year-long pilot of IntelliCommand. This was the Jones Lang LaSalle smart building solution powered by Pacific Controls technology. In addition to achieving an average combined savings of 10 percent across the pilot property portfolio, which included office, laboratory and distribution space, P&G uncovered new ways to improve energy efficiency. IntelliCommand's data analytics showed that a cooling system was working harder than necessary to compensate for higher temperatures created by malfunctioning air handlers."

Other companies offering smart building solutions include Enlighted, which develops office building sensors that sense when and where exactly in rooms people are, and adjusts the full light/heating conditions of individual parts of the room accordingly; EnTouch, which offers an energy management system to reduce energy usage through data analytics, performance diagnostics and managed services; and McKenney's, an in-building automation and security outfit in the Southeast that leverages Splunk software that analyzes all of the machine data generated by buildings to improve the operations and security of things like air conditioners, elevators, light switches, and security doors.

According to the U.S. Small Business Administration, retail companies and restaurants spend nearly $20 billion annually on energy – and cutting these costs by even 10 percent can boost profit margins by as much as 2 to 4 percent. M2M

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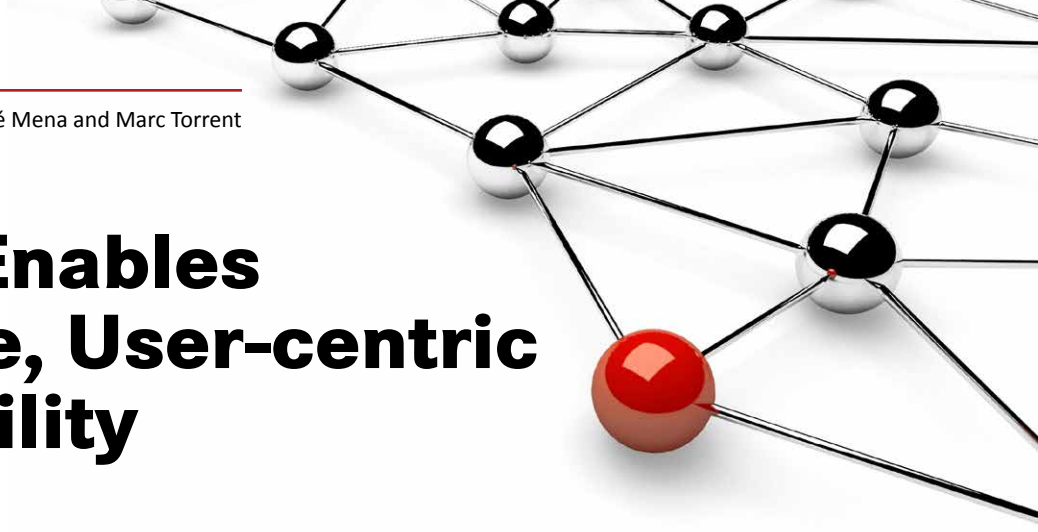


Superhub Enables Sustainable, User-centric Urban Mobility

An efficient, user-friendly and green mobility system represents a key component for ensuring a sustainable development for the European society and economy. It reduces the energy consumption and greenhouse gas emissions related to transport, which represents 30 percent of the energy consumption of the UE-27 and is a major source of greenhouse gas emissions and pollutants.

Advanced information and communications technologies could play a major role in promoting an integrated view of multimodal mobility as a system at the service of people. However, a purely technology-centric approach may fall short on persuading users to change their habits and behaviors, unless it is coupled to a user-centric approach whereby people play an active role in the definition and shaping of the mobility ecosystem. The European R&D SUPERHUB project has developed an open platform able to combine in real time all mobility offers from the relevant stakeholders together with a set of enabling mobility services able to address users' mobility needs, redesign transport route options, and foster behavioral changes.

Urban mobility requires finding an appropriate balance between the individual benefits of mobility ("By taking my car I can be downtown in 10 minutes") and the general collective welfare (related, e.g., to pollution and congestion levels). Without a change in users' perceptions, habits and behaviors related to mobility, no major enhancements in terms of social welfare can be achieved. The implementation of such measures cannot be effective without people's willingness to participate in this effort. This in particular requires the design and development of tools able to find and choose the means of transport most adapted to a desired route, design new transport routes from the available options in terms of travel time and energy costs (CO2 footprint), and put in contact the traveller and the different means of transport caregivers.

The European R&D SUPERHUB project aims to provide such an integrated toolkit, able to stimulate citizens and goods transport companies to use alternative and more sustainable mobility resources. It provides a web- and mobile-accessible open platform capable of gathering all urban transport services in real time to suggest different route options to users based on their preferences, the environmental impact, and the traffic conditions.

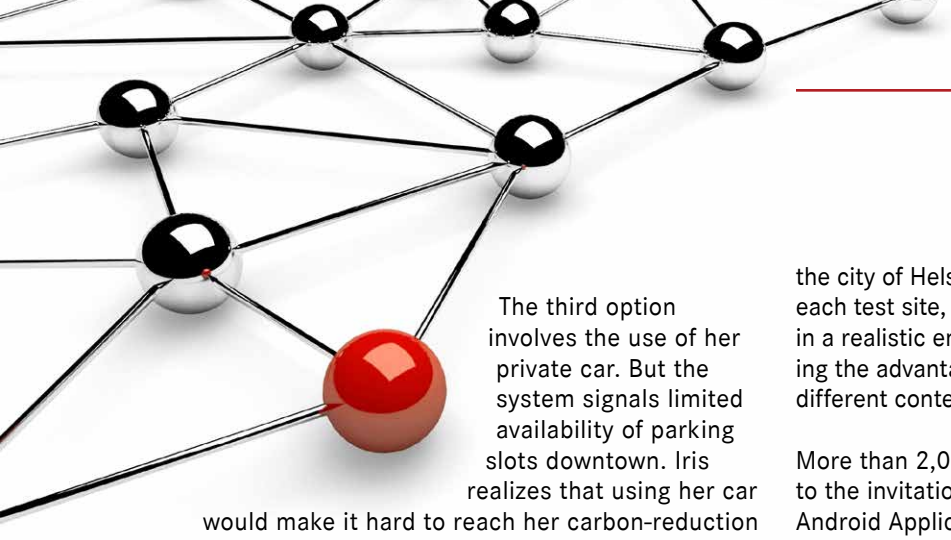
Twenty international partners are participating in the project, which will last three years and has a budget of 10 million euros. The effort is co-funded through the Seventh Framework Programme of the European Union.

Based on users' profile preferences, the system will offer several paths with the most suitable mobility mixes available aiming to optimize the quality of the travel and the impact on the overall transport system as well as their quality and service (reliability) conditions. The mobility solutions and combinations include use of own vehicle, public transportation, car and bike-sharing services, etc. The available options are characterized by cost associated, expected travel time, expected amount of CO2 generated (carbon footprint associated), and potential risks and externalities associated.

Example Scenario

An example usage scenario of the SUPERHUB system is the following: "It's 7 a.m. on a Monday morning, and Iris wakes up. While Iris is having a coffee, her daily planner application sends a query to the SUPERHUB system, asking for options to reach the offices of Arghila Inc., located downtown, where she has a meeting with a potential customer scheduled at 9 a.m.

The SUPERHUB system gathers information on the public transport options available, the current traffic conditions, parking places' availability, and offers for a seat in car-pooling. This information is matched to Iris' profile, resulting in three possible options that are displayed on Iris' smartphone. The top ranked one includes a walk to the bike-sharing center and then a ride downtown. It has the lowest carbon footprint, but the longest expected travel time. An alarm notifies the possible arrival of rain showers in the afternoon. Iris decides to move to the next one, which encompasses a walk down to the bus station and the use of two buses to get to the meeting. Iris knows that at this time of the day, buses are usually packed, so she discards this itinerary.



The third option involves the use of her private car. But the system signals limited availability of parking slots downtown. Iris realizes that using her car would make it hard to reach her carbon-reduction target for this week. And she had been doing so well. So, Iris thinks of taking the risks of rain showers and goes for the first option.

Key Results

SUPERHUB is driving a new urban mobility service ecosystem where everybody wins: People will get quick information and generate less pollution as they travel, traffic companies will be able to manage their services more effectively, and public organizations will be able to better assess the results of their mobility policies. It will provide a number of key results, including:

- **Mobility user studies:** This involves a number of studies, carried out with end users, to provide detailed functional requirements on the end services to be offered to citizens.

- **Systems and methods for real-time reasoning on mobility data:** The SUPERHUB platform will include capabilities to reason in real time on data streams coming from heterogeneous sources.

- **Algorithms and protocols for traffic inference from mobile users:** Appropriate techniques will be developed for inferring traffic conditions based on the tracking of mobile users' location.

- **A dynamic route planning and negotiation engine**

- **SUPERHUB integrated platform** This will be an integrated working SUPERHUB prototype, to be used in service trials with the objective of performing technical validation of the technologies developed and an evaluation of the concept from a service and business point of view.

The SUPERHUB consortium is strongly motivated to achieve these objectives and results since the proposed project brings together the interest of a number of stakeholders present in the consortium like public authorities, local transport operators, along with European companies related to mobility that will benefit from the set of services and solutions produced to improve the efficiency of future urban mobility systems.

Pilot Tests

The SUPERHUB Project includes the creation of three test sites, located in Spain (in the city of Barcelona), Finland (in the city of Helsinki) and Italy (in the province of Milan). In each test site, the SUPERHUB functionalities have been tested in a realistic environment with large numbers of users, showing the advantages brought by the SUPERHUB solutions in different contextual background.

More than 2,000 organizations have positively answered to the invitation to test the beta version of the SUPERHUB Android Application, showing interest in being pro-actively involved in the project, and more than 700 users, fitting with demographical and mobility habits criteria defined in trial methodology, have been selected and equipped with all instruments to start the trial. In Barcelona, the pilot test was coordinated by BDigital. The project enjoyed the participation of 300 volunteers, urban travellers who moved around the Catalan city and metropolitan area, testing the app with their smartphones.

The users have provided meaningful feedback for improving the SUPERHUB platform, useful to continue and enhance the user-centered process carried out from the beginning of the project. Letting the users interact with the app and using it in the real world has allowed SUPERHUB to gather very valuable insights to check whether we were fulfilling their requirements and needs or not. The vast majority of the users, both citizens and mobility experts, found the functionalities offered by the project very useful and promising.

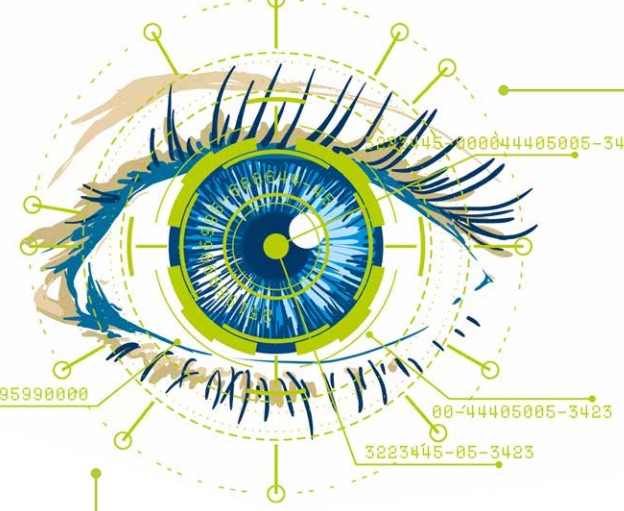
This first prototype focused mainly on having static data about timetables and public transport information, though incorporating some real-time data like the weather info. For the second trials, real time will be the main goal: to have an adaptive system that reacts on the fly to the current context of the cities.

Applying the knowledge gathered from the lessons learned and the improvements foreseen in the preparation of the final trials (expected June 2014), SUPERHUB will have a very good opportunity to demonstrate the exceptional work carried out by the consortium during the project.

Consortium

The European SUPERHUB consortium is led by GFI ADELIOR NV. Participants include Diesis, CREATE-NET, Fondazione Legambiente, VODAFONE, ETRA I&D, the University of Aberdeen, Barcelona City Council, the Czech Transport Research Centre, the University of Helsinki, the Technical University of Catalonia, Barcelona Digital Technology Centre, the Czech Technical University in Prague, the Barcelona Metropolitan Transport Authority, Autoguidovie, Accanto Systems, Game2Growth, eXrade and Azienda Trasporti Milanesi. M2M

Marc Torrent is Ph.D, head of mobility and energy R&D, and José Mena, is mobility and energy R&D researcher at BDigital (www.bdigital.org).



by Paula Bernier

Asset Sharing & the On-Demand Movement

Or, How Connectivity is Enabling People to Be More Efficient Consumers

Apple in 2003 launched the iTunes Music Store, which for the first time allowed consumers to purchase and immediately download just the song or songs they wanted for 99 cents each. For a generation of people who had spent a lifetime ponying up $7 or more for a multi-song cassette tape, CD, or LP record, this was truly a revolution both in terms of real-time media delivery and customer choice.

How It All Started

Today, an array of on-demand programming providers – including Amazon Prime, Hulu, Netflix, cablecos and telcos – now put an impressive library of movies and programs at your fingertips. All you need is a broadband connection; a computer, specialty set-top box-enabled TV, or wireless device; and a subscription to one of the above-named services, and you're good to go.

Amazon also was a pioneer of the on-demand frontier when, in 2006, it launched Amazon Web Services. It allows companies to buy only the networking resources they require, when they need them. That's why Amazon uses the term elastic in describing the model. AWS has been an incredible success, with Amazon's S3 offerings alone representing 2 trillion objects stored and $2 billion in revenues.

Many others have since introduced subscription-based services that deliver on-demand databases, servers, storage, and other infrastructure, platforms and services. This group now includes everyone from Google and Microsoft, to HP and IBM, to the largest telephone companies and cloud hosting outfits, to the latest startups.

Sharing in the Physical World

Now the on-demand model is moving beyond media and networking to also address the physical world.

Clothing for rent has popped up as one of the more prominent examples in this space.

Young women's clothing seems to be the leader here, with players in this realm including such businesses as CoutureSqd, Le Tote, Girl Meets Dress, and Rent the Runway. Maternity clothing rental is the focus of Borrow For Your Bump, which seems to make a lot of sense considering

the cost of maternity wear, the limited window in which most women use it, and the fact that pregnant women and young children are an ever-changing but enduring customer space. There are also online men's clothing rental entities such Trunk Club, which ship "hand-selected" clothing that stylists choose for you.

For $35 a month CoutureSqd customers are asked to complete a style profile, based on which the company picks four garments for them. The duds of shipped to the customer, who can keep them for 30 days, at which point they are opt to purchase them or return them using the prepaid shipping label.

Le Tote has a similar model, but charges $49 a month and allows subscribers to specifically select the clothing and jewelry they want. In this case, customers can keep the goods as long as they wish; once they return their last shipment, Le Tote sends them a new one.

As for Girl Meets Dress, this London-based business is more about outfitting young women in dresses for specific events like black tie galas, proms and weddings (although the website also features daytime and work dress options). Consumers can opt either to pay a one-time, per-night fee for a dress, or pay a monthly fee for access to any dress once a month.

Girl Meets Dress appears to be a copycat of the earlier to market Rent the Runway business, which has been around for four or five years and greatly expanded its selection of designer wear during that time. That makes sense, given online rental of luxury goods is expected to increase 113 percent in 2014.

On-the-Go Sharing

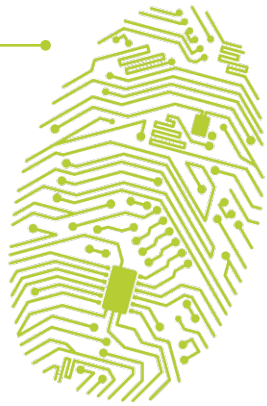
Like clothing, cars are also now available on demand in many cities in the U.S. and abroad. These new efforts go by such names as car2go, easyCar, and Zipcar. Although some of them are connected to big names like Avis and Daimler, unlike traditional car rental entities, these upstarts enable people to pick up and drop off cars from a variety of locations and use them for as long as they like. And M2M can help enable that.

There are 26 car sharing programs in the U.S. with 806,332 members and 12,634 vehicles, according to Susan Shaheen of the University of California-Berkeley. As of October 2012, car sharing was available in 27 countries in which 1,788,000 members shared more than 43,550 vehicles.

Daimler-owned car2go, which launched operations in Ulm, Germany, and Austin, Texas, in 2009, owns a fleet of low-emission, two-person vehicles, which are parked throughout the cities and charged for by the minute. There are now 25 cities in which car2go is currently in operation. That includes Austin, Calgary, Columbus, Denver, Miami, Minneapolis, Montreal, Portland, San Diego, Seattle, Toronto, Vancouver, and Washington, D.C., in North America, and Amsterdam, Berlin, Birmingham, Cologne, Dusseldorf, Hamburg, London, Milan, Munich, Stuttgart, Ulm and Vienna.

Zipcar, an entity of rental car giant Avis, meanwhile, has operations at college campuses and urban areas in Austria, Canada, the U.K. and the U.K. It offers a wide array of vehicles that folks can use by the hour or the day. Memberships sell for $60 a year or $6 a month, and per hour driving rates – which include gas and insurance – range from $8 to $10 an hour.

Both of these car sharing companies, in addition to Getaround, RelayRides and WeCar (an Enterprise Rent-a-Car service) do business in Portland, Ore., among other cities. Portland considers itself the car sharing capital of the world. It is the home of the first U.S. car sharing service, known as Car Sharing Portland, which launched in 1998, and as of March 2012 boarded nearly one shared car per 1,000 residents.



Not all of the car sharing services have seen success. WhipCar was another peer-to-peer car rental operation, but it shut down this spring after just three years in business. This model allowed car owners to rent their vehicles to a neighbor.

But, for the most part, it seems people are bullish on the prospects for car sharing.

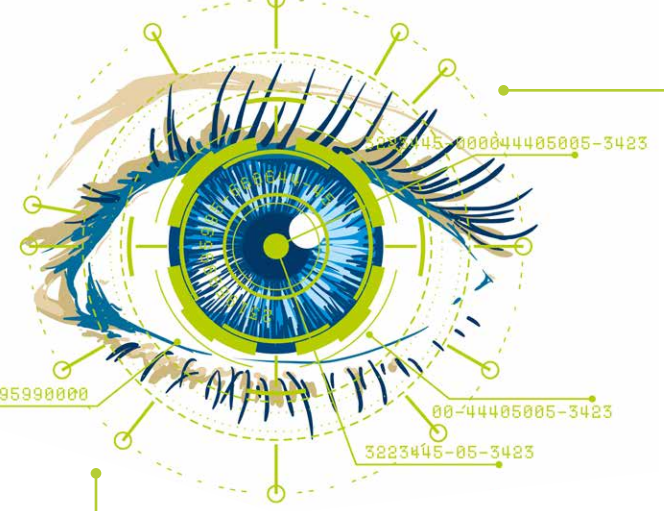
In an August blog, Car Sharing Portland founder Dave Brook wrote: "Like me you've probably noticed the hundreds of millions of dollars being invested in services like Car2Go, DriveNow (one way), Über, Lyft & Sidecar (taxi) and CiteeCar (plain old round trip carsharing). The sharing economy is a hot topic, not only on the blogosphere, but with entrepreneurs, VC firms and in the bureaus of a number of major cities around the world. Something is definitely happening and it's going to transform mobility in urban areas, soon!"

The Underlying Drivers

So why are these various on-demand programs being launched and taking off now, and what can we expect next on this front?

The rise of the subscription-based economy, as some are calling it, appears to be driven by a confluence of factors. That may include the difficult economic environment, the shift to urban living, growing concern about how conspicuous consumption is negatively impacting the environment, and a new generation with a higher comfort level with technology and different values than previous generations.

Walker Sands recently released the 2014 Future of Retail Study, which



revealed that most consumers are open to renting a variety of products, even if they haven't done so in the past. In fact, Tory Patrick, account director and lead of the retail technology practice at the public relations firm, told M2M Evolution magazine that 5 percent of U.S. consumers already are members of subscription retail services, which she said means there's huge potential for growth on this front.

U.S. consumers ages 18 to 25 are 90 percent more likely than those over the age of 60 to have participated in renting a product instead of making a purchase in the last year, according to Walker Sands. In fact, 37 percent of consumers ages 18 to 25 have already participated in renting instead of buying in the last year, the firm reports, with 63 percent planning to do so in 2014. This is compared to 27 percent of overall consumers who have already done so and 56 percent who plan to do so in the next year.

A related trend Patrick is seeing is the try-before-you-buy model, which gives consumers the ability to rent-to-own a dress, for example, or purchase sample-size versions of high-end makeup products. Birchbox is a great example of the latter category. Subscription-based services along the lines of Birchbox address the desires to economize and try before you guy, she said, but they also can save time for the consumer.

"People are ok with not owning and not having everything," added Patrick, who suggests that retailers might consider rethinking their business models to figure out whether adding rent and/or rent-to-own services might make sense.

So that's a snapshot of what's happening with goods like clothing relative to the on-demand movement. But what about more high-priced purchases such as shelter and transportation?

Clearly, ownership of a home, and one or more vehicles, has for many years been considered synonymous with the American Dream. Yet, according to data from Gervais & Fisher, young people today are less likely to buy a home despite the general availability of what are considered affordable homes that can be financed at very attractive interest rates. That is attributed in part to people delaying marriage (and singles are less likely to make major investments on things like homes) as well as unemployment and underemployment. Many people of all ages also have foregone car purchases in recent years due to the tough economy.

According to Pew, median household income in 2012 remained below the 2007 pre-Recession level, and just barely above its 1995 level.

"This is the longest period of stagnant median household income since the Census Bureau began collecting such data in 1967," Pew stated.

The difficult economy also almost certainly drove interest in smaller and more fuel-efficient cars like the Fiat 500, the Nissan Leaf, the Smart car, the Toyota Prius, and all the other compacts and subcompact cars on the market that many car-buying consumers have purchased over the giant, gas-sucking SUVs that have ruled the road in recent years. It also probably contributed to the trend toward renting, smaller homes, and even microhomes.

But all of the above may be driven as much by the new normal of our economy as it is by (mostly) younger consumers' willingness to share and their waning interest in living large – at least in the traditional sense. Small is the new big, whether we're talking automobiles, bank accounts, computers, music players, or physical assets. Whoever dies with the most toys wins simply isn't a motto that applies as widely as it once did.

The fact that there's a growing migration to urban areas, in which people live closer together, also makes sharing cars, clothing and even pets, easier than ever.

"For the first time in history, more than half of the world's population lives in cities," according to an article on the website of The Paul H. Nitze School of Advanced International Studies at John Hopkins University.

It estimates that 200,000 people make the rural to urban migration daily, and note that more than 90 percent of this migration is happening in developing countries. A 2012 McKinsey & Co. report, meanwhile, notes that large U.S. cities are home to 80 percent of the U.S. population compared with less than 60 percent in Western Europe.

As a recent Slate article noted, that, and the rise of new delivery mechanisms like the Amazon drone, which the company has previewed but not released, could make it even easier to share and rent things going forward. M2M

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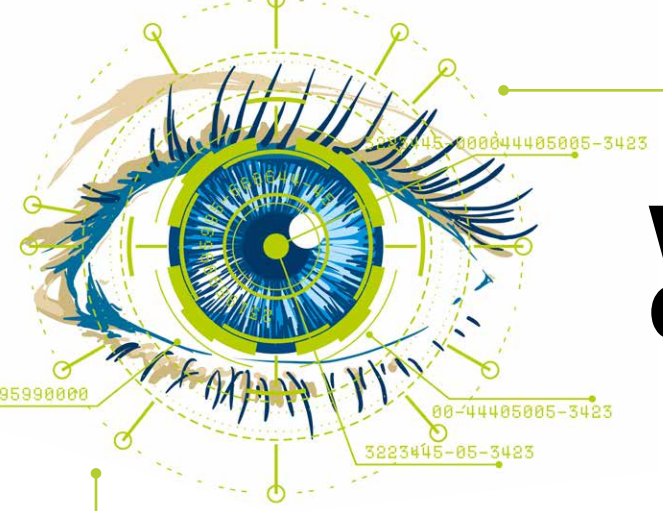

by Paula Bernier

What's New in Connected Cars

The connected car segment continues to show forward movement. About 17 percent of U.S. households already own a vehicle with a connected system, such as Ford Sync or OnStar, according to the Consumer Electronics Association, which expects sales of in-vehicle technologies to grow by nearly 20 percent this year to reach $11 billion. Meanwhile, Gartner predicts that by 2016 the majority of average car buyers for a standard brand vehicle in mature markets will expect at least basic web-based information availability in their new automobiles. And, Garner says, by the end of 2020 more than 80 percent of all new vehicles sold in mature markets such as the U.S. will offer connected-vehicle functionality.

Audi, Chrysler, Ford, General Motors, Mercedes, Toyota and Volvo were among the vehicle brands making a splash this year at CES. In fact, automotive companies this year increased by 25 percent their floor space at the event, according to the CEA, which puts on the show.

Among the CES keynoters was Audi. Rupert Stadler, chairman of the board of management of AUDI AG, was expected to present the company's ideas for future developments in the field of electronics.

In a Nov. 19 press release, Audi of America said its connected car would arrive in the U.S. in spring in the form of the Audi A3 sedan. The new vehicle will include built-in 4G LTE connectivity, which will allow for smoother renderings of Google Earth and Google Street View; faster downloads and high-definition video streaming for up to eight devices running over the car's embedded Wi-Fi hotspot; the ability to have news, Facebook and Twitter alerts read to you; access to more than 7,000 web radio stations; and more.

Executives from AT&T, Ericsson and Qualcomm were part of the "FutureCast Global Innovation of Mobile" keynote panel CES, which explored how mobile technology is driving change in critical areas such as disruptive innovation, smart cities, transportation, health care and the workplace.

And partners Ericsson and Volvo Cars debuted Volvo Cars' Sensus Connect. Built on Ericsson's Connected Vehicle Cloud, Sensus Connect is Volvo's on-board experience, which combines connected services, infotainment, navigation and audio. Ericsson says that Sensus Connect also offers what it calls the world's first car to infrastructure communication feature Park & Pay. The companies also announced the U.S. launch of Volvo on Call, a global telematics solution through which motorists can use a smartphone to check their vehicle's fuel level, manage climate control, lock and unlock doors, and through which they can request emergency services or roadside assistance.

Meanwhile, Ford around CES announced that SYNC AppLink will be available on 3.4 million more vehicles later this year. The free upgrade enables current Ford owners to access and control smartphone apps via voice command.

The company launched SYNC back in 2007 and introduced SYNC AppLink, which is

now supported in more than 1 million vehicles, in 2010. SYNC AppLink now allows users to control more than 60 smartphone mobile apps – on both iOS and Android platforms - using the car's voice commands, so drivers can keep their eyes on the road and their hands on the wheel. To support SYNC, Ford has an open developer program at www.developer.ford.com.

The company in January also announced that it has tweaked its organization to help further Ford's vision to deliver a seamless customer experience for drivers – both inside and outside of the vehicle. And it hired on Don Butler to lead Ford's charge to develop what the company calls a fully integrated connected car experience.

Jim Farley, executive vice president of global marketing, sales and service and Lincoln, notes that the connected car opportunity is much bigger than just in-car technology.

"It's now about connecting the vehicle to a larger ecosystem leveraging the Internet of things," says Farley. "We are creating a seamless and immersive experience for customers that begins with their first visit to our digital sites and continues throughout their ownership experience."

Ford's CES press release also says: "With the eventual proliferation of embedded telematics capabilities for Ford Motor Company's SYNC system, as recently announced on Lincoln MKC, a newly aligned organization will manage connectivity across the entire enterprise."

Mercedes-Benz was expected to show a concept car that connects with a Pebble smartwatch, according to a CNET report, which explained that the car's software sends vehicle data and current navigation information to the watch.

A different CNET story talks about how buyers of Chevrolet's 2015 Corvette will be able to order a Performance Data Recorder to be installed on the car. That includes a 720p camera behind the top of the windshield and an SD card reader to enable the car to record video footage and data such as acceleration, steering, and the like, which drivers can review and share.

Of course, many of the behind-the-scenes and smaller suppliers to automotive companies also continue to role out new solutions. For example, Nuance Communications Inc. recently introduced a new iteration of its Dragon Drive connected car platform, which combines Nuance's natural language voice understanding with new content and applications. Audi, BMW, Daimler, Toyota and others today leverage Dragon Drive.

To create a compelling connected car experience, automotive manufacturers often need to involve multiple parties to bring in capabilities like voice command, and desired content and applications, said Chris Schreiner, director of automotive consumer insights for Strategy Analytics.

"By combining a content and applications services platform with its leading voice and NLU capabilities," added Schreiner, "Nuance is simplifying the connected car integration for automakers with access to all of the customizable components they require."

On a separate front, Visteon Corp. was at CES presenting its automotive cockpit electronics products, and had expected to unveil two new automotive brands – one for connected audio and infotainment, and one for instrumentation – at the show.

The company's HMeye cockpit allows motorists to manage auto controls through gestures including eye gaze and head direction. New this year at CES was Visteon's OASIS, which provides secure user-to-vehicle connectivity leveraging cloud computing.

Big names in tech like Apple and Google, of course, are not sitting on the sidelines in the race to realize the connected car.

As noted in a recent BCR piece, Apple in June announced its iOS in the Car initiative, which integrates the in-car display with iOS devices. No auto brands had been announced as of press time, but BCR says Apple expects about a dozen car makers to use it starting this year.

Of course, Google continues its work on the driverless car. Meanwhile, Google, according to The Wall Street Journal, was expected at CES to announce a partnership with Audi to develop in-car entertainment and information systems based on Android.

Research firm IHS expects self-driving cars including driver control to hit highways around the globe before 2025 and self-driving "only" cars to appear in the 2030 time frame. IHS expects nearly 54 million self-driving cars on the road worldwide by 2035.

"There are several benefits from self-driving cars to society, drivers and pedestrians," said Egil Juliussen, principal analyst for infotainment and autonomous driver assisted systems at IHS Automotive. Juliussen co-authored the study with IHS Automotive senior ADAS analyst Jeremy Carlson. "Accident rates will plunge to near zero for SDCs, although other cars will crash into SDCs, but as the market share of SDCs on the highway grows, overall accident rates will decline steadily. Traffic congestion and air pollution per car should also decline because SDCs can be programmed to be more efficient in their driving patterns." M2M

by Carl Ford

The Embedded System Hot List

Embedded systems are everywhere! From your watch, to your car, to the traffic light that has you stopped and the video surveillance system that is ticketing you remotely.

The primary reason for using embedded systems is to match requirements for performance and scalability. While general computing systems deliver flexibility, the goal of embedded systems is to limit the process to optimize the size, cost, energy consumption and reliability. In M2M this is often associated with sensors of various kinds.

In the world of telematics our cars are now including over two hundred chips managing and monitoring various aspects of transport.

In developing embedded systems developers focus on making the software run the system without further interaction by placing it in the firmware of the chip.

Even though an embedded system is hardware, normally the software engineers on a team outnumber the hardware engineers two to one. More than half the systems being developed are on 32-bit processors and the common language is C/C++.

Additionally the design phases, perhaps because these systems are meant to be deployed and not touched again, represent more than 50 percent of the development time with another quarter spent debugging the system. Just fewer than 50 percent of embedded systems are delivered on time, with the majority of the delays lasting less than two months.

The tools to help develop embedded systems include editors, assemblers, compilers, debuggers, simulators, emulators, and Flash/OTP programmers. Many of these tools are included in the starter sets of the various chip manufacturers.

Recent Phenomena

While Arduino and Raspberry Pi were designed to teach students about the development, it turns out that many developers are finding these systems a great way to get proof of concept. In addition we have companies like Gemalto that are enabling a concept board that works with Arduino boards.

While not specifically on The Hot List, I will give these boards honorable mention, because I believe they are going to impact and reduce design for years to come. If you want to take advantage of these systems you can purchase Arduino boards from http://www.arduino.cc and Raspberry Pi from Premier Farnell and RS Components.

With all respect to the software that dominates the development of an embedded system our Hot List is dedicated to the chips. This list not all inclusive, but it represents probably a majority of implementations being delivered today. It is missing companies like Oracle and WindRiver that focus on the software for embedded systems.

Words of warning: I am giving you my perspective on their website and support. It is not my intention to have you dismiss any of these companies based on my remarks. I was very impressed with most of these companies' support for embedded systems developers, which is why these companies are listed. Not everyone on this list supports every operating system (or for that matter runtime solution). In the future I intend to produce an OS-oriented Hot List.

1. **ARM http://www.arm.com** dominates the mobile world but licenses its designs to equipment manufacturers; however, it provides some useful tools to see how to work with its chips.

2. Atmel http://www.atmel.com/ is the base system for both Arduino and Raspberry Pi. "Atmel Corp. provides the electronics industry with complete system solutions focused on industrial, consumer, security, communications, computing and automotive markets."

3. Broadcom http://www.broadcom.com is very strong in video and cable boxes. The company refers to itself as a global innovation leader in semiconductor solutions for wired and wireless communications.

4. FreeScale https://community.freescale.com/welcome has one of the better community pages where it's clear if you work using the company's equipment you will not be alone. "Freescale is a leader in embedded processing solutions for the automotive, consumer, industrial and networking markets."

5. IAR http://www.iar.com offers strong software with developer tools. "IAR Embedded Workbench with its integrated IAR C/C++ Compiler and C-SPY Debugger is the natural choice for wireless applications. In addition, IAR Systems offers a complete solution of RTOS and middleware components such as TCP/IP and USB that can enhance your embedded design."

6. Intel http://www.intel.com/ probably has the most aggressive strategy out there as it looks to gain wireless market share with M2M and IoT implementations. "Intel's embedded design center website helps people port their solutions. Intel offers customer reference boards, development kits, and evaluation boards that assist developers in prototyping solutions, performance evaluations, and porting application software."

7. Microchip http://www.microchip.com offers a site that looks like it's built by double Es for double Es. "Microchip Technology Inc. is a leading provider of microcontroller and analog semiconductors, providing low-risk product development, lower total system cost and faster time to market for thousands of diverse customer applications worldwide."

8. NXP http://www.nxp.com/ has a very strong tie in to sensor solutions. "NXP Semiconductors N.V. creates solutions that enable secure connections for a smarter world. Building on its expertise in High Performance Mixed Signal electronics, NXP is driving innovation in the automotive, identification and mobile industries, and in application areas including wireless infrastructure, lighting, healthcare, industrial, consumer tech and computing."

9. Qualcomm http://www.qualcomm.com continues to lead the way in wireless. Here was something interesting said about its Gobi chips in a press release: "Embedded modules based on the Gobi fifth generation reference platform will initially be available from Huawei, Novatel Wireless, Option, Sierra Wireless and ZTE in several form factors and regional configurations, making them a compelling 4G LTE solution for a variety of connected mobile devices."

10. ST Microelectronics http://www.st.com/web/en/home.html is strong in terms of power consumption. "A world leader in providing the semiconductor solutions that makes a positive contribution to people's lives, both today and in the future" is how the company describes itself on the website.

11. Texas Instruments http://www.ti.com/ offers the most popular chip for many applications and one with lots of partners that have add-on development tools to work with. "TI supports a variety of OS strategies on [its] chips and you can find reference designs leveraging the best in TI technology – from embedded processors to analog signal chain and power management. All TI Designs include a schematic, test data and design files."

12. Xilinx http://www.xilinx.com/ is focused on FPGA and Performance. "Xilinx processing capabilities provide performance and customization across a wide range of end markets including aerospace and defense, wired and wireless communications, automotive, audio/video broadcast, industrial control, test and measurement, and consumer." M2M

Carl Ford is CEO and community developer at Crossfire Media (www.xfiremedia.com).

by Carl Ford

2014: The Year of New M2M Services

This year has been a strong year for M2M and as predicted by our friend James Brehm, a time of consolidation. With the acquisition of ILS Technology by Telit and Thingworx by PTC, we are seeing companies aimed at delivering more of a complete package. The story for the next year is going to be one of more consolidations and specifically acquisitions that will match up well to selling services.

The recent entry of GE into the mix indicates that the market wants to see M2M impact the bottom line internally. Manufacturing and operations are going to be a large focus of the year ahead. In theory there is a lot to be done. The benefit of buying services over solutions has a lot to do with accounting and software.

First, let's talk about software and, in particular, Marc Andreesen's insight that "software is eating the world."

The real story is that with the development of smartphones and applications, the user interface has changed forever. We think nothing of looking at our smartphones for everything from directions to taxi rides. This bypasses a lot of traditional thinking about where and when we manage operations. The result is that software is driving changes in the marketplace, and the companies that adapt the quickest to the change in models are probably going to be in a position to dominate.

Andreesen also points out that solutions like Amazon Web Services change the game completely in terms of starting up companies. This has a very Silicon Valley view to it and probably should be tempered with some skepticism for the deployment of sensors. However, the point is that wireless Internet and the services rendered on top of the Internet make the constraints of geography less problematic.

That brings us to accounting.

In effect, the baseline of running things internally has enabled third-party solutions to sell savings while representing an expense rather than an investment. Working capital is no longer subject to the need for big iron. Additionally, the services that are taking over for the expenses are being sold based on a level of requirements.

Trane will service your building at a comfortable temperature rather than selling you a heating and cooling system. It will probably even have an app that lets you monitor the system, as well as overrides for operations to reset when the building is unoccupied.

In the boardroom then the financials are going to smooth out on the expense side and the focus will be on revenues. However, as the execs hear about their development, projections and pipeline, they may want to ask where they can offer services.

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One aspect that is particularly interesting to me is the continual building of ecosystems around specific companies. My take is many of the acquisitions in the year ahead will be of partners becoming assimilated – those companies that make the software solutions that transform traditional product companies and enable new services.

If 2013 was the year of the platform, in M2M 2014 promises to be the year of new services. M2M

Carl Ford is CEO and community developer at Crossfire Media (www.xfiremedia.com).

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by Rich Tehrani

Wearable Tech Evolves Before Our Eyes

If you want to marvel at the future of wearable tech, as well as the future of augmented reality, take a look at a video from Atheer Labs (http://tinyurl.com/n83mhsf), which shows just how fast things can evolve before our eyes.

Just a few years back Corning wowed many with its Day Made of Glass video series (http://tinyurl.com/l26fdcf), which envisioned a world in which every surface was intelligent thanks to its smart-glass solutions. Now, however, we see that augmented reality in many ways alleviates the need to add glass to every surface with which we come in contact.

Almost overnight the concept of wearable technology has wiped out potentially tens of billions of dollars of extra spending to touch-and-display-enable our world. Wow. Talk about a disruptive technology – smart glass getting disrupted by smart glasses.

If you want to learn more, check out the Atheer labs Indiegogo funding page where you can donate $10, purchase a pair of Atheer One glasses for $400, a variety of developer and gift kits, and more.

While you're online, you might want to check into TMC's site related to Wearable Tech Expo (http://tinyurl.com/ocaagwc), which will be held on July 23-24, 2014, at the NYU Kimmel Center in New York City.

Wearable tech is obviously a hot new area, which is why TMC recently launched the Wearable Tech Expo. Our most recent event took place in December in Los Angeles.

Among the featured speakers at the December Wearable Tech Expo was Philippe Khan (http://tinyurl.com/qbsugkh). He is one of the tech entrepreneurs and visionaries who really defines the term successful serial entrepreneur and inventor. In the 1980s, Khan was CEO of Borland, the company which made a number of programming tools and eventually purchased Paradox, the most-popular full-featured PC database program. TMC ran on both Turbo C and Paradox in the eighties; I know this because I was the person in charge of the programming and running IT at the time. I first used Turbo C in college on a 286 clone that I believe ran at 10 or 12mHz. Thankfully, Turbo C was a fast compiler. To give you an idea of what connectivity was like at the time, the campus mainframe had a 300-baud modem connection.

What is more incredible is what Khan has done since those early days. In the mid-nineties he founded Starfish Software, a pioneer in the wireless synchronization market. The company was later sold to Motorola. Shortly thereafter he founded LightSurf – the first company to integrate the camera and phone. The company was later sold to Verisign then Syniverse Technologies. In 2003 he founded Fullpower Technologies to focus on the convergence of life sciences, wireless technology, accelerometrics, nanotechnology and microelectromechanical systems. The company's MotionX Technology platform powers many end user solutions from the Nike+ GPS to the Jawbone Up band.

This is where the story converges with the theme of wearable tech and Wearable Tech Expo, at which Paul Gaudino of Adidas, Cary Bran of PLT Labs/Plantronics, and Dan Cui of Vuzix where also presenters. To check out the speaker lineup and get other details about the next Wearable Tech Expo, visit: www.wearabletechworld.com/conference/newyork-2014/

Speaking of personal technology, it was clear that Microsoft had a tough time during the holiday season. Wal-Mart alone sold 1.4 million tablets on Thanksgiving, which is exactly why Microsoft and its hardware retail partners and Intel desperately need a piece of the tablet pie.

The result? The companies finally put out an ad – really it's a Dell ad for the Venue 8 Pro – which is worth watching (http://tinyurl.com/mohoudz). It features a traveler on an airplane who has no space and is still able to work with his office apps and more.

But I have to wonder why Microsoft, now the proud owner of Skype – a consumer technology that could entice potential buyers – doesn't mention that fact in the ad somewhere.

In any case, I hope you enjoy it as much as I did. You may also want to check out the Scroogled ad (http://tinyurl.com/ogd4yce) Microsoft recently ran, which pokes holes in the Chromebook computer.

It really seems the incumbent providers have finally woken up and are prepared to fight. Now the question will be whether buyers are ready to give up Apple and Android in favor of Microsoft and Dell. M2M

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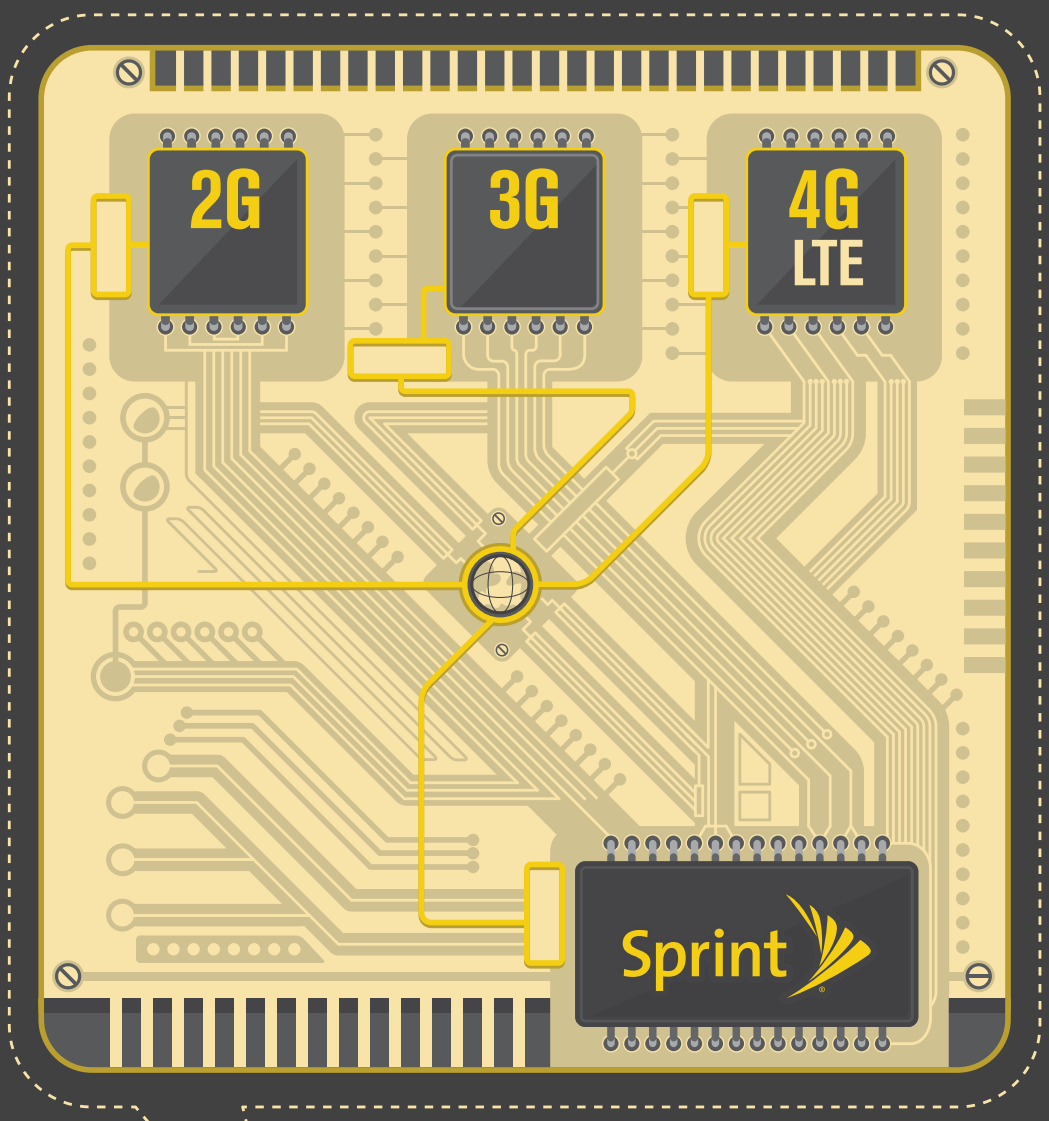

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