

The Beginning of the M2M Evolution

1st Quarter 2013 Vol.1/Number 1

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Fleet Management:
It Moves a Village

The Cloud's Ties to M2M

Benefits Go Far Beyond Pay-as-You-Go

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M2M Evolution magazine is published quarterly by Technology Marketing Corp. Annual digital subscriptions; Free to qualifying U.S., Canada and foreign subscribers. Annual print subscriptions; Free to qualifying U.S. subscribers; \$24 U.S. nonqualifying, \$34 Canada, \$48 foreign qualifying and nonqualifying. All orders are payable in advance U.S. dollars drawn against a U.S. bank. Connecticut residents add applicable sales tax.

Postmaster: Send address changes to M2M Evolution magazine, Technology Marketing Corporation, River Park, 800 Connecticut Ave., 1st Fl., Norwalk, CT 06854-1628 USA

Canada Post: Publications Mail Agreement #40612608

Canada Returns to be sent to: Pieney Bowes International, P. O. Box 25542, London, ON N6C 6B2, CANADA

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M2M Evolution magazine encourages readers to contact us with their questions, comments, and suggestions. Send all editorial-related e-mail to Paula Bernier at pbernier@tmcnet.com. We reserve the right to edit letters for clarity and brevity. All submissions will be considered eligible for publication unless otherwise specified by the author.

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For List Rentals, please contact Jill Olsen at JOlsen@listincorporated.com or call 914-765-0700, ext. 105.



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THE INTERNET OF THINGS

by Paula Bernier



Welcome to M2M Evolution

Hello! You are holding in your hands (or reading online) the inaugural issue of M2M Evolution magazine. M2M Evolution magazine is committed to helping executives like you understand and benefit from the shift to connected devices.

In case you're not already familiar with the term, M2M stands for machine-to-machine communications. Machine-to-machine communications enables equipment anywhere in the world to provide data on its own status, relay other information and/or be remotely controlled. That can translate into significant savings and new revenue opportunities for businesses like yours.

As James Brehm mentions in his column in this issue, numbers are all over the map in terms of M2M marketplace estimates and forecasts given there's no standard on what's being included. But, as he also notes, all indicators are that this market is on an elevator going up.

Brehm's company, Compass Intelligence, says the M2M market is already at \$27 million and is set to grow to more than \$120 million by 2017.

Brian Patridge of the Yankee Group tells me that the connectivity only part of the M2M market was just under \$6 billion in 2012, and that you can multiply that two-and-half times if you add in platforms and applications services. His forecasts for 2016 take the connectivity piece to \$8 billion, he says, which can be multiplied by 20 to get the total 2016 M2M market value if you figure platforms and applications into the mix.

ABI Research, meanwhile, notes that M2M is one of the fastest growing tech businesses in the world and believes this space will top \$31 billion by the end of 2016.

Whatever your angle on it, it's clear that the opportunity here is huge given M2M applies to everything from automated teller machines to the electrical grid and oil rigs to heart monitors to security

cameras to your refrigerator and thermostat, and more.

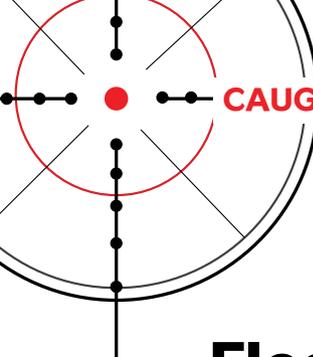
Auto and fleet, health care and smart energy are among the especially hot verticals for M2M. See our CES show and Hot List coverage for more on auto and fleet. As for health care, monitoring applications can be used in hospitals or clinics, or even within patient homes. If M2M can allow a patient to stay in his or her home as opposed to within a hospital or other health care facility, it could potentially result in better treatment for patients, and health care savings for end users, doctors and/or insurance companies. That's not to mention the fact that M2M can ensure medicine and food get to their destinations in a condition that is safe for human consumption.

Major companies such as General Electric and General Motors, among many others, already have launched M2M initiatives. GE, for example, uses M2M to maintain its wind turbines, which without this technology would have to be scaled and inspected by field technicians. GM, meanwhile, has long used M2M to power its OnStar in-vehicle navigation system. And now many other automobile and truck companies, among others, are following suit - leveraging machine-to-machine technology not only to provide drivers with guidance, but also to deliver other information and entertainment applications.

Meet Our Advisory Board

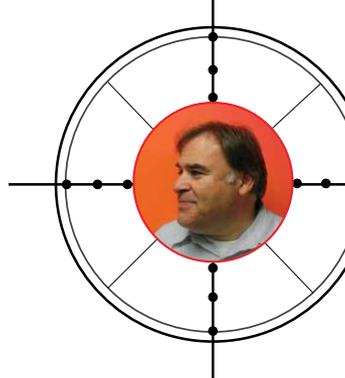
In this, the inaugural issue of M2M Evolution magazine, we'd like to introduce you to our advisory board. It includes AT&T's Mobeen Khan, Axeda's Dan Murphy, Compass Intelligence's James Brehm, CradlePoint's Ken Hosac, Crossfire Media's Carl Ford, KORE's Alex Brisbane, Numerex's Jeff Smith, OnAsset's Nikki Cuban, RACO's John Horn. In the pages that follow, several of our advisory board members share their views on the machine-to-machine space. Others will appear in subsequent issues. **M2M**





CAUGHT IN THE CROSSFIRE

by Carl Ford



Fleet of Foot

Some VCs and M&A types have been hanging out with our friends in the M2M space looking to see if the time is right for consolidation. Looking at fleet management and the 150 companies I found (so far), I have been seeing opportunity for a lot of consolidation. I have also seen a segmented market.

Some companies have very specific functions, particularly those focused on brokerage-based services and less than truckload opportunities. Others are billing platforms, which based on some interviews we have conducted with fleet managers may still need a better software implementation.

Many companies seem to be corporate versions of the Peter Principal. Their websites are something from 2000 Web 1.0 with pictures of old phones and links to partners that no longer exist or whose names have changed. Some company sites clearly show that they believe the web is not part of their marketing campaign.

However while some companies lack vision, there are companies that are taking advantage of the market.

Some companies see the opportunity as expansion of the territory and markets.

Let me highlight some of the PR...

Peak – Ryzex merge

By acquiring Ryzex, PEAK Technologies greatly expands its geographic reach and gains additional capabilities in areas such as mobility managed services, advanced mobile technology support services and other innovative mobile device offerings.

AFS Technologies acquires Qoufore

The acquisition of Qoufore complements the existing AFS mobile product offering and significantly expands the

company's market reach into more than 40 countries.

Trimble acquires Logicway

Michel Van Maercke, general manager of Trimble's T&L group for EMEA: "Logicway's software currently integrates with Trimble's T&L solutions. It is an ideal fit to expand our back-office capabilities to add even more value to our customers. In addition, Logicway's open platform allows for collaboration with other vendors in the T&L space."

Even the exception to the rule is looking globally.

Telogis acquires Navtrak

"This acquisition broadens our customer portfolio with greater reach into small- and mid-sized markets, and complements our strong organic growth with large enterprises and OEM channels," said Dave Cozzens, CEO of Telogis.

The companies with the PR and the quotes are not necessarily ahead of many others. The fact the VCs are looking indicates an opportunity. And it's clear we see a gap in marketing.

As the battle of the platforms has shown us at the last M2M event, it's not whether these companies can be self sustaining, it's about the fact that the opportunities are now expanding. The same platform that does asset management or workforce automation can blend into fleet management.

So consolidation is coming and we are going are probably going to see this happen the next eighteen months.

Let the seller prepare. **M2M**

Carl Ford is co-founder of Crossfire Media (www.crossfire.com), a TMC partner that puts on the M2M Evolution Conference & Expo.



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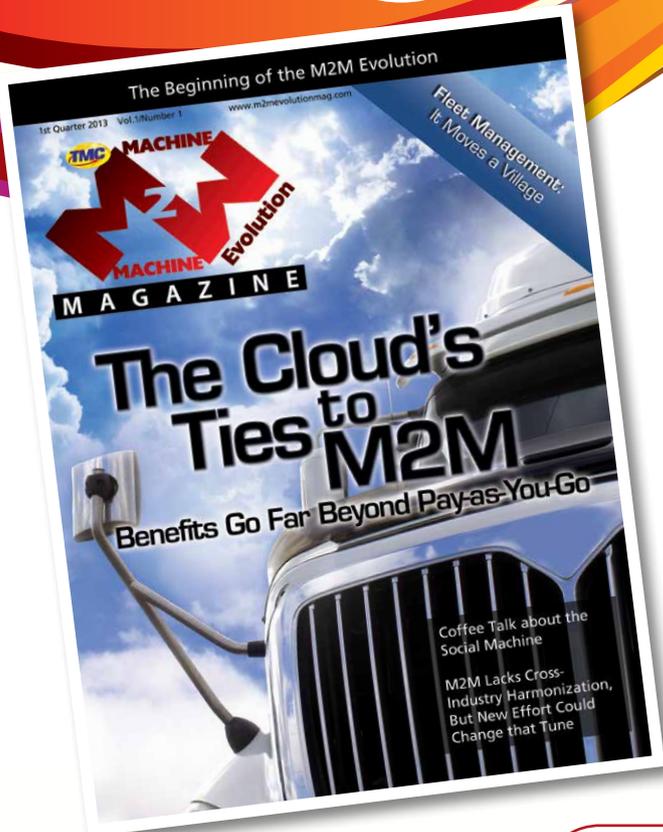


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On the Cover

Cover Story

- 18** The Cloud's Ties to M2M Benefits Go Far Beyond Pay-as-You-Go
by Paula Bernier

Advisory Board

- 12** Catching the M2M Wave
by John Horn
- 13** The Path to Rapid Innovation via Connected Products
by Dan Murphy
- 14** 4G LTE Enables Richer M2M Experiences
by Ken Hosac

INSIDE Every Issue

- 3** The Internet of Things
by Paula Bernier
- 4** Caught in the Crossfire
by Carl Ford
- 8** Navigating M2M
by James Brehm
- 9** Making M2M Work
by Christopher John Rezendes
- 10** M2M Transcendent
by Tony Rizzo
- 38** Making Connections
by Rich Tehrani

Sections & Series

- 16** Brief Case
European Farmers Leverage M2M in Cow Insemination, Birthing Process
by Paula Bernier
- 22** Network
Standard Practice
by Paula Bernier
- 24** Endpoints
24 NETGEAR Expands to Address the Smart Home
by Paula Bernier
- 25** Cisco Introduces Videoscape Unity
by Paula Bernier
- 25** LG Shows Smart Home Solution
by Paula Bernier
- 26** M2M Does 3D-SiP
by Bob Emmerson
- 27** Geotab's Fleet Management System Is Truly Plug-and-Play
by Rich Steeves
- 28** Digital Signage Pops Up in New Places, New Ways
by Paula Bernier
- 30** The Hot List
Fleet Management: It Moves a Village
by Carl Ford
- 32** Bits
- 34** Boardroom Report
Big Blue Helps Wade through the Sea of Data
by Carl Ford
- 36** Corner Office
Coffee Talk about the Social Machine, M2M and the Cloud
by Paula Bernier

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by James Brehm



The Unwired Experience

Thanks for joining me with the first installment of my column in this, the inaugural issue of M2M Evolution magazine. If you've ever met me or seen me speak at a conference, you already know what those whom I haven't yet met will soon know. While I try to utilize empirical information in my decision making process, I can be fairly opinionated at times and sometimes have trouble holding my tongue. But there's never any malice in my utterances. I'm just a call it like you see it kind of guy.

I've been working with the TMC team as a speaker, moderator, and conference chair of the M2M Evolution conference for a few years now and have been looking at M2M and associated areas for nearly a decade. In that time, I've witnessed best practices, seen my share of deployment disasters and even been privy to some remarkable behind-the-scenes information. With that in mind, my goal for this column is to inform, enlighten, engage, enrage (where appropriate), entertain and educate readers on M2M, the Internet of things, and all things connected as I see it.

State of the Market

How big is the market? Well, that's a loaded question. If you were to poll the top 10 industry analysts covering the M2M market and ask the questions "how big is the market today?" and "how big is the market poised to get?", you'd end up with 10 different answers on market size. Not only that, you'd end up with 10 different answers on market potential, 10 different answers on how fast the market is growing, and 10 different definitions for what's being counted. The only consensus you'd receive is around the fact that the market is maturing, has a huge TAM (total addressable market) and is growing rapidly. Plotting those numbers on charts would yield hockey sticks of differing angles – all pointing upward and to the right.

Market Size

Compass Intelligence believes the U.S. M2M and connected device market will end 2012 with approximately 33 million connections, growing at 20 percent per year and that the U.S. represents just shy of one-third of the global market.

But what does that mean? The truth of the matter is that our numbers, and those of every other firm out there, are wrong. They're estimates and forecasts and by definition they're wrong. What's more, I made some sweeping M2M generalizations that have no business being made. You see, what I did there was lump together multiple vertical and application solutions and name them machine-to-machine communication. But M2M is not a singular market, it's a market of markets. From the connected car to m-health, the smart grid to connected home automation and security solutions, each individual application area has unique needs and requirements – its own drivers, restraints, challenges

and opportunities. What's most important in getting accurate numbers is in making good assumptions. And when you make hard decisions with inaccurate numbers – well, bad numbers lead to bad decisions.

So now that I've set a baseline that the numbers are wrong and that it's what goes into coming up with these numbers that matters, let's just all agree the market is big and its potential is huge, O.K.? Let's not really worry about what the number is; too much time is spent on determining exactly what the total market size is and who's got market share today. Let's just assume it's going to move upward and to the right over time. Because the only problem we have is that with numbers like these, how in the world are we going to get to M2M nirvana? How are we going to reach Ericsson's 50 billion device prediction? And more importantly, since telemetry applications have been around for over a decade, why is everything moving so slow?

Numbers that Really Matter

Earlier this year, Compass Intelligence did some survey work to delve into these problems, and we found some interesting things. In a survey of more than 7,000 IT decision makers, with all the hype surrounding the term (a recent Google search using the term M2M yielded 21.3 million results), fewer than 20 percent could identify what the term M2M meant. Wow!

What's more, just 6 percent of IT decision makers say they'd deployed M2M, but when we asked the question another way, we found out more than 18 percent had actually deployed some form of M2M. And while more than 50 percent were interested in M2M as a way to decrease costs or drive new revenue streams, most didn't know what the real payoff was or have the faintest idea of how to calculate ROI.

But perhaps the most telling statistic we found was when we talked to members of the M2M ecosystem. More than 80 percent of M2M planned projects that are initiated fail somewhere along the way.

Is the problem awareness, lack of standards, process issues, lengthy deployment cycles, channel problems, definitional issues, training, technology, a bad taxonomy? It's all of these things and more.

We'll explore these things more as we journey down this path together in future issues and at the M2M Evolution conference. Thanks for letting me rant, and if you've got solutions to any of the issues above and want to talk about it, just let me know. See you next quarter! **M2M**

James Brehm is senior strategist at Compass Intelligence (www.compassintelligence.com).





How Are We Going to Make M2M and IoT Work?

Much sweat and toil is going into the technical requirements to make M2M and the Internet of things work. Voted on applied standards; percolated best practice standards; negotiated 'co-operative' standards are all good and valuable work.

However, we think as much – perhaps more – work needs done in policies, commercial approaches and standard operating procedures for data management in order for M2M and IoT markets to work.

And a solid, if scary, starting point is data privacy.

At INEX Advisors we have staked out a position against freemium services for M2M and IoT markets. We are urging our clients, partners and portfolio companies to pursue the strongest possible value propositions that will resonate with key stakeholders in such a resounding way that they will not only forget about life pre-M2M/IoT enabled operation or process; but, that they will gladly pay reasonable fees or tools for the capabilities.

The Catch, The Rub and The Key

There are many challenges to scaling a business outside of a freemium model. And that is the big catch. Freemium is a tried and true approach for scaling a digital business quickly. Many consumer markets expect it. Some demand it.

But, there is a rub with freemium. You have to share your personal information and your experience – perhaps deep, expansive aspects of your experience. And you have to share it with perhaps deep and expansive communities of marketers looking to sell you their idea, their product, their service, their candidate. And that is the rub with freemium.

And when you think about how difficult it will be to track all of the data that your newly connected devices will be sharing (we call that digital exhaust), creating device intelligence databases for marketers, we get nervous. People have a hard enough time considering and controlling the digital footprints they leave when they operate on the net.

It will be impossible for people to actively monitor what their unattended devices share. So we think the key to making M2M and IoT markets work is clear: explicit policies for the management of the digital exhaust these unattended devices throw off. To be clear, we do not have the answer, but we think we can help frame the challenge and the opportunity with a little more clarity by picking up an aspirational application that is quickly becoming iconic for the market: the connected refrigerator.

Scenarios For Managing Connected Refrigerator Digital Exhaust

We are under no illusion that this is virgin territory. This privacy debate is light years bigger than the talented people at INEX Advisors can master. However, it appears to us that the M2M and IoT markets have significant room for improvement in advancing by attacking the lack of clarity in privacy and data management policy.

Simply put: He/she who pays, benefits. So, who in the connected consumer refrigeration ecosystem gets what data? What can they do with it? What must

they pay – in cash, data sharing, time – or contribute for it?

In order to facilitate discussion around innumerable potential scenarios to answer this question, we oversimplify to two dimensions: Stakeholder Classes
Data Classes

As you think through your scenario, remember to ask the deeper questions such as: Is the data anonymized?
Batched or individualized?
Metadata encoded or not?
Real-time, event-based or periodic?
What defines real-time, event and period?

Try mapping different scenarios. Consider how you would sit with various privacy and commercial schemes. We think you will agree that once you start to move away from freemium concepts, you open up a whole new world of commercial possibilities that can co-exist with stronger privacy management policies.

So How Do We Navigate This Challenge?

Ask simple questions about value. We think that these questions and concepts have some value as a general filter or frame to apply to any number of IoT and M2M ideas: Are there obvious, inherent flaws, limitations, inefficiencies, inconsistencies or other performance gaps in consumer refrigerators that IoT or M2M solutions will address? Do refrigerators have any embedded digital intelligence? Does it have basic, embedded computing, control or communications capabilities? Who are the primary stakeholders involved in the consumer refrigeration ecosystem? How would those stakeholders benefit from a connected refrigerator? **M2M**

Christopher J. Rezendes is president of INEX Advisors (www.inexadvisors.com).





Finding Meaning

There is a very fine reason why TMC is embarking on the path of a new machine-to-machine magazine: M2M Evolution is all about a now vital technology, especially from the perspective of wireless and mobile technology, an area I happen to be intimately familiar with, having covered the mobile realm for well over a decade. M2M is at a critical point in its existence, but I think it has moved beyond evolution – in fact, I consider it a transcendent moment in time for M2M, hence the name of this column.

What does transcendent mean exactly? It can mean beyond or above the range of normal or merely physical human experience, as in, for example, a transcendent level of knowledge. More simply, it means surpassing the ordinary or being exceptional.

But it's also more than that. Let me turn to part of a quote by John Milton (it's always useful to apply 17th century quotes to 21st century technology): "...those transcendent moments of awe that change forever how we experience life and the world." That gets very close to what M2M transcendent means as far as I'm concerned. It's what makes M2M worthy of its other means of identification: The Internet of things. That sounds quite Godlike and all encompassing in its way – or transcendent.

What's the purpose of M2M? Its essential purpose today is to create simple but vast channels of communications and real-time data gathering that we all hope will enhance our everyday lives and work. This will be done with enormous collections of wireless sensors and embedded mobile devices that will see, listen, feel, measure, aggregate and report all manner of information 7 days a week, and 24 hours a day, more or less non-stop. Much of this will happen automatically and behind the scenes and won't involve any human interactions. In some cases those devices will engage and interact with us as well.

We will now be able to gather data that was formerly difficult to collect and aggregate. This is the essence of M2M today as we move

full speed ahead into 2013. To date, the key challenge has been to establish reliable communications and connectivity between devices, and to get the data transported from widely dispersed edges, where data is gathered, back to central locations where that data can be monitored and acted upon. M2M today already helps to automate decisions and tasks: restock a soft drink machine or instantly diagnose a fault in or handle an alert from a machine, for example.

With the right software and the right collections of sensors we can also find the best routes for transportation based on cargo and type of travel vehicle, or more human related things such as being able to anticipate a heart attack or a possible stroke.

Tomorrow, and certainly by 2015, we anticipate an inevitable shift to what end users want to do with M2M. During a recent conversation I had with Oliver Bussmann, SAP's global CIO (these days much more a strategic thinker for SAP than anything else), we got around to talking about SAP's in-memory database, HANNA, and some of the driving forces behind its development. Bussmann noted a number of these forces, and chief among them were various M2M-focused issues that include the need to:

- * support business decisions with real-time M2M data intelligence;
- * secure and manage significant streams of M2M data;
- * identify and create new applications for M2M; and
- * mine enormous amounts of data – big data, that's right – to learn things we never knew before.

In addition, SAP sees at least three key verticals as the most promising for delivering significant M2M applications that have large revenue streams attached to them: Transport and logistics: Fleet management, driver monitoring, vehicle diagnostics, insurance reporting for multinational corporations, but also smaller enterprises. Utilities: Smart metering and smart grid initiatives in electricity, but also gas and water. Automotive: Infotainment, vehicle diagnostics, insurance reporting for private individuals.

Health care is of high M2M interest to SAP, but Bussmann noted that health care ecosystem complexity remains a challenge to overcome.

M2M becomes transcendent as we transition from the ability to collect data and respond to simple alerts to being able to analyze and factor out deep meaning from big data. **M2M**

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



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Catching the M2M Wave

Having essentially been in the machine-to-machine business since its inception, it is amazing to see where we have come from. Like watching a small ripple in the ocean grow to become a powerful wave, the Internet of things has been building at a breakneck speed to bring things and people together. Many experts expect the momentum of the M2M wave to even accelerate its rate of growth and coverage. With this industry growth we are seeing some advanced innovations that touch almost every part of life.

Through innovative M2M applications, intelligence is being spread across a variety of verticals. Farming, for instance, has seen some major technological developments. Many vineyards are now equipped with sensors that are able to monitor an assortment of characteristics from soil moisture levels to trunk diameter – giving farmers real-time, remote intelligence and control of their product.

Home security is experiencing an extreme makeover as its market demands greater control of everything from home appliances to energy and water use. It is amazing that a homeowner can now lock the front door to his or her home, turn on the lights, and start the dishwasher while sitting in a different country.

The health care world is also being profoundly touched by the development of M2M technologies. It is now well within the realm of possibility that through a sensor or device worn on the body, data relating to the health of a person's heart can be wirelessly transmitted to a monitoring service that identifies any irregularities. If irregularities are found,

the proper preventative steps can then be taken to avoid a potential catastrophe.

With just a few examples of the application of this technology, it is easy to see how bright the future of M2M could be. However, just like the wave that was previously mentioned, I believe with the growth that we are seeing and forecasting, we will reach a breaking point unless scale can be improved.

Currently the M2M ecosystem is very fragmented with specialists scattered across the globe. We see little niches everywhere, from certification experts to software developers. While this diversity has been great for innovation, there will come a time (very quickly) that scale will be needed to meet the tsunami of demand.

The projections are well documented with anywhere from 12 billion to the infamous prediction of 50 billion connected devices by the year 2020. Wherever the number falls, people from outside of our world are taking notice – particularly in the capital markets.

Private equity giant Blackstone has entered the game in a big way. Even global conglomerate General Electric has committed more than \$100 billion to ride this wave. Giants like HP, IBM and Intel also see a blue ocean of opportunity. Both the likely and unlikely are all looking to get behind M2M, and this momentum could not come at a better time.

We are at a point in the M2M industry where the market is demanding increased and improved scale from everyone, carriers to customer service specialists. This industry is ripe for consolidation and in order to realize the growth ahead, business needs to be made easy. The fragmented ecosystem that we now live in must be brought together. It must be easy for solution providers to meet the needs and growing scale of their consumers that are coming en masse.

Historical challenges of managing devices, especially those that cross borders, must be simplified. That means developing continuity with mobile networks and overcoming regulatory hurdles; even supply chain capabilities for module manufacturers will need to develop. All of these things and more are necessary to maximize both the financial ROI and user benefit of M2M.

As we move forward and momentum continues to build, I believe that the industry will experience a major transformation in the way that business is done. No longer will it be led by individual and separate specialists with limited scope, it will be led by those having a combination of the proper global resources and alliances, experience, and tools. **M2M**

John Horn is president of RACO Wireless (www.racowireless.com).



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The Path to Rapid Innovation via Connected Products

The world is rapidly moving to connected products. Companies are leveraging the data and intelligence from these connected products to create smarter business processes that will transform their businesses and drive improvements in efficiencies and effectiveness. They will also use connectivity to remotely control products and to differentiate their offerings. But connectivity is only the beginning. The real value comes from the data and intelligence that connected products provide. Companies are using this machine data to transform customer experiences, to create new applications, and ultimately to innovate at a faster pace.

At Axeda, we have developed a connected product maturity model based on best practices gleaned from hundreds of engagements over the course of more than 10 years with product manufacturers from nearly every industry. The level of maturity relates to the degree of integration of business processes and functions – from initial connection to differentiated services and solutions. Product manufacturers use this model to understand how to advance along the curve in achieving connected product innovation.

The convergence of connected products, wireless networks, cloud services, and enterprise business systems will drive enormous opportunities. To capitalize, C-level functions will need to think and act differently. Understanding the steps of a connected product maturity model is helpful to benchmark, gauge progress, and achieve goals.

With machine-to-machine technology, many organizations begin their con-

ected product initiatives with remote service programs. It's a proven business model with measurable ROI in the form of a recurring revenue stream, less fixed capital, and higher margins. Designed and executed properly, the same success of these programs can be achieved across the organization, creating an unbreakable bond with your customers. Companies who were early in bringing their products online are now realizing that the real gold in M2M is integrating that data with enterprise systems, such as CRM, ERP, PLM, or data warehouses – optimizing critical business processes and essentially M2M-izing their organizations. Realizing this business transformation is the key for market leaders to emerge in the new connected product economy.

The Connected Product Maturity Model has six levels. Each level represents the progression of overall M2M maturity, bears discrete capabilities, and shows the return that your organization will realize by expanding its

M2M capabilities. The purpose of this model is for you to understand your organization's current M2M capabilities along a continuum of value. It can also serve as a benchmarking tool against competitors who are providing differentiation. Below is a more detailed explanation of each level as well as the action steps your organization can take to move forward to the next level of the model.

We live in a connected world. Connected products provide organizations in every industry with new opportunities to tap the value of data in the products around us. M2M is extending the reach of businesses around the world so companies can offer new, high-value, managed services for both corporate and consumer users. Innovation from M2M extends beyond service, intelligence and new cloud services. A renewed focus on integrating connected products with enterprise business systems is the critical factor to drive value. Development of new innovative applications that leverage connectivity is critical to differentiating products in today's very competitive markets.

I am very excited to be on the advisory board of TMC's M2M Evolution magazine. The M2M and connected products industry has created a revolution of industrial innovation unlike any we have seen in our generation. Being able to contribute on an advisory level to the first and only publication truly dedicated to this market is a thrill. **M2M**

Dan Murphy is vice president of marketing at Axeda Corp. (www.axeda.com).





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4G LTE Enables Richer M2M Experiences

In this inaugural edition of M2M Evolution, it's appropriate to note that the word evolution is a fitting way to describe the past, present and future of machine-to-machine communications. To appreciate how fast things will change in the future, it's helpful to understand the past.

Ham Radio and M2M

I earned my ham radio license when I was 14 years old. At that time, amateur short-wave radio was the primary means of communicating with many parts of the world due to its ability to reach locations thousands of miles away. About the same time that I earned my license in 1981, however, TCP/IP was being formalized as the standard communication protocol for the Internet.

As the Internet evolved, the combination of e-mail and pervasive Internet access relegated shortwave radio from a primary means of communication to hobby status.

The initial form of radio communication was Morse code, which was required learning for my license. As the technology progressed, amateur radio operators were able to add voice communication and eventually packet radio, forming the early foundations of cellular voice and data communications. Much of today's 3G/4G technologies trace their roots to amateur radio and the technologists (a.k.a. packeteers) who practiced it.

Similarly, many of the packet radio technologies pioneered by amateur radio were also utilized in the early days of M2M to connect remote devices wirelessly. These private RF networks provided a level of flexibility and reach not attainable with wired connections. The emergence of pervasive 3G/4G mobile broadband networks, however, relegated these

proprietary RF networks to legacy status – another victim of technological evolution.

Connecting Today's Devices

Today, most new M2M devices are Internet enabled with a TCP/IP stack and wirelessly enabled with a 3G/4G modem that leverages widely available mobile broadband networks from major carriers. The economies of scale associated with commercial off-the-shelf components are enormous, enabling a large growing population of M2M devices, new approaches to connecting M2M devices, and even creating new categories of M2M devices that didn't exist before.

The vast scope of connected devices is difficult to grasp, spanning multiple applications in all industry verticals, including smart meters, HVAC control, medical devices, traffic systems, telematics, just to name a few.

Most of us involved in M2M only see a portion of the available applications. For example, my company develops 4G/Wi-Fi-enabled M2M routers, which are commonly used in kiosks, digital signage, video surveillance, and vehicle applications. However, the varying requirements, physical size, and deployment quantities of different M2M applications are not conducive to a one-size-fits-all approach. This has led to a highly-dispersed ecosystem of companies that focus on the unique market requirements of different applications.

The router approach works well for applications with moderate deployment volumes (i.e., less than 200,000 units) and with medium to large sized-devices (the router is the size of my fist). In fact, one of the largest outdoor sign companies in the U.S., YESCO, is using CradlePoint routers in its digital outdoor signs and field maintenance trucks.

On the other hand, compact designs such as a wearable medical device or higher volume deployments such as smart meters may require a 3G/4G module or even a 3G/4G chipset to achieve the target size or economies of scale for a given application. The module or chipset approach, however, does require significantly more time and resources for system design and integration, as well as for carrier certification.

Looking Ahead

Most insiders predict that the next major wave of innovation in M2M devices will be driven by new applications that leverage the pervasive availability of high bandwidth from 4G LTE. Here in North America, 4G LTE expansions continue to march forward toward 100 percent network deployment. The availability of this high bandwidth enables more extensive use of rich multimedia and cloud-based applications for M2M devices that wouldn't otherwise be possible with earlier generations of mobile broadband data.

Our kiosk customers, for example, have learned that they can sell more product when they add video to their kiosks. **M2M**

Ken Hosac is vp-business development at CradlePoint (www.cradlepoint.com).



Here's a way to make business decisions.

May we suggest another?

If your M2M application doesn't integrate directly into your enterprise IT systems, you're rolling the dice when it comes time to make critical business decisions. That's why ILS Technology developed the deviceWISE M2M Application Platform with enterprise IT in mind.

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European Farmers Leverage M2M in Cow Insemination, Birthing Processes

As you're probably already aware, the potential applications for machine-to-machine technology are far and wide. If you've been following this space, chances are good that you've already heard about the use of M2M relative to connected cars, fleet and other assets; patient and medicine monitoring; energy; and smart homes. These are key applications around which many players, and many current and potential users, in the M2M space are focused.

But there are also many much more specialized applications for M2M, which are helping users realize significant benefits. While these applications sometimes exist on a smaller scale, they are nonetheless meeting important user requirements while contributing to the growth of machine-to-machine communications in aggregate.

One such application involves texting, the French, and animals in heat.

Do we have your attention now? Good. Here's the story.

Life on the farm may seem like a pastoral endeavor to city folk, but individuals in the agriculture and livestock profession have to move quickly when, for example, a cow is ready to give birth or is in heat and ready for insemination. That's because insemination is typically only viable during a six- to eight-hour time period, a timeslot that has shrunken significantly over the years. That means a farmer can miss the window of opportunity if he or she is not constantly on watch and ready to move when the opportunity arises.

However, M2M technology today is helping farmers keep abreast of the rhythms of birthing-age cows, alerting them when the animals display signs of being ready to deliver or prime for insemination. That way, farmers can go about their business rather than remaining stable-side.



Predicting when a cow is in heat is no easy feat, but one common sign is restless behavior. To monitor movement of cows, several farmers in Europe are trying a new M2M solution based on the HeatPhone and Vel'Phone offerings of French IT firm Medria Technologies (See above.) The offering is in use in 5,000 farming test cases as of the end of 2012. It consists of M2M-enabled wireless cow collars, GSM-based data collectors installed in stables or pastures, and mobile connectivity provided by Deutsche Telekom.

"M2M solutions deliver major benefits in nearly all industries," says Jürgen Hase, head of Deutsche Telekom's M2M Competence Center. "That is why we are banking on innovative partners like MEDRIA Technologies, who know the specific demand and use cases in their industry. Together with strong partners, we develop and provide end-to-end M2M applications to best serve customer demand."

Vital statistics on the cows is collected by the sensors in the collars and sent every 30 minutes to the centralized data store. Farmers and other authorized individuals can check their cows' vital information as desired on a specified website. And when a cow begins to move around a lot, the M2M solution triggers an alarm. That prompts the M2M SIM card in the data collector in the pasture or stable to send a text to the farmer's mobile phone and, in some cases, to the local veterinarian. **M2M**

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The Cloud's Ties to M2M

Benefits Go Far Beyond Pay-as-You-Go

Cloud and M2M are two of the hottest topics in communications today. But, you may be asking yourself, just how do the two relate to one another?

They don't have to, but increasingly, there are.

Consider this: An M2M device itself generates a relatively small amount of data. But when you consider that billions of these devices will be out in the world collecting and then spitting back out information, things add up quickly. Enter the cloud, which offers M2M benefits not only in terms of connectivity and storage, but also in terms of data convergence and, as a result, real business benefits.

Historically, M2M projects have been expensive to get off the ground, so the classic argument of cloud about offloading capex is an obvious value proposition again in this case, says Bill Zujewski, executive vice president of product strategy and marketing at Axeda, a 12-year-old company that provides cloud-based M2M services. The cloud is also a great place for organizations to store the massive amounts of data that can be generated by M2M applications, adds Zujewski, who says that some customers' M2M applications generate millions of readings an hour.

The cloud makes it simpler to get devices connected because the cloud abstracts the complexity, adds Brian Anderson, vice president of marketing solutions and services at Sierra Wireless, which sells embeddable radios, modems and gateways, and a cloud-based M2M device management and application platform. Sierra Wireless recently forged a partnership with Amazon Web Services, which allows for the

combination of M2M, the cloud, and the integration of M2M data with information in other databases. In this scenario, Amazon hosts the application and Sierra hosts the data via its AirVantage M2M Cloud.

Making data available via the cloud means it's easier for enterprises to propagate that data to other departments, businesses, etc., adds Zujewski. Axeda connects machines to its cloud, processes machine data, allows users to store that data in the Axeda cloud, provides prepackaged services and a set of API and web services so others can build custom apps, and offers the ability to integrate data from all of the above with information in other apps like Salesforce.com.

Customers of Axeda consist mostly of M2M machine manufacturers, including more than 60 medical equipment companies, high tech outfits and ATM owners. These customers usually start off with remote monitoring as their first application, but often expand their M2M efforts from there to tie in with other data, and to unearth business intelligence. About a third of Axeda's customers use the Salesforce.com Service Cloud, so the cloud enables them to share their data between the Axeda apps and Service Cloud. While data that resides on customer premises tends to involve flat file exports and spreadsheets, he says, the cloud relies on RESTful APIs, which look like http and make it very easy for applications, developers and IT business analysts to extract the needed data and potentially leverage it in other applications.

"Cloud will play a major role economically and enable broader use of machine data," Zujewski says.

Indeed. And the social machine, as it is being called, is one concept that will move that forward.

"The social machine is all about how do I bring real-time device info into the Service Cloud so the devices can open cases all by themselves," says Joel Young, CTO and senior vice president of R&D at Digi International, which sells cloud-based M2M solutions.

Young elaborates: If you are an MRI machine, rather than having to tell someone you're low on helium, wouldn't it be better if the machine could tell the helium company that automatically and directly? You could do so by telling Service Cloud to open a ticket on that.

Service Cloud is an offering from Salesforce.com that runs on the cloud service provider's Force.com platform. Service Cloud from Salesforce.com delivers a multi-channel, collaborative, and operationally efficient contact center; social support; customer communities, including Chatter; and more. The Social Contact Center aspect of Service Cloud allows work in the form of service cases or tickets to be created, tracked, routed and escalated across all channels.

When asked what components or ingredients are involved in the social machine, Young answers that it's a combination of Service Cloud and his own company's iDigi solution.

Digi has been working to build a connection from its iDigi cloud platform to Salesforce, he says, adding this effort tackles

connectivity between the two platforms from a device standpoint. At the same time Etherios, which Digi bought in November, had a similar initiative under way, but that relates to integration from a workforce point of view. When Digi acquired Etherios, it created a development team to merge those two code bases to deliver a much more integrated application, which gives users an opportunity to configure a workforce task which would then configure an API within iDigi and reporting within iDigi, and then automatically configure connections within Force.com. That way the user no longer has to do multiple configurations of iDigi and

Salesforce, he explains. Digi expects to be in customer betas with this integrated solution starting in February and aims to test uses cases as part of the effort.

Peter Coffee, vice president and head of platform research for Salesforce.com, says that the first iteration of the social machine is Amazon's recommendation engine, but that today's confluence of devices with rich sensor capability combined with connectivity and social algorithms that help us distill floods of data into insight is opening up a bevy of new possibilities for solving problems,

Today's confluence of devices with rich sensor capability combined with connectivity and social algorithms that help us distill floods of data into insight is opening up a bevy of new possibilities for solving problems.



lowering costs, and increasing profitability – and doing it all in a way that involves big picture thinking.

For example, it's now possible to collect and analyze data to understand who among many car owners is getting the best mileage from the Chevy Volt; to look at an entire operation, rather than just piece parts, to enable wind farm optimization; and to get a much broader understanding on spam and malware threats so we can guard against them. That means businesses can react and do product design proactively rather than reactively, Coffee points out.

"It's vital to get over the idea that mobile just means portable and small enough to fit in your pocket," Coffee tells M2M Evolution.

A mobile device, he points out, has sense of your location, whether you're moving and at what approximate rate of speed, and the potential to connect to a cloud-based calendar or other data so it knows what you are doing and where you are going. This kind of information goes well beyond frivolous applications such as sharing your whereabouts and activities with friends, Coffee says; such data can be used to help organizations save some serious money.

For example, some companies' businesses rely on filling vending machines or calibrating medical devices. Of course, some of these machines or devices need attending to immediately, while others are further down on the to-do list, he says. By combining M2M and business analytics and even common business applications within the cloud, organizations can more efficiently leverage the time of their field staff members so they hit the most important jobs first, but are alerted if they're in the area of lower-priority jobs they can take care of them as well if time permits.

"The world is full of 1 percent problems," says Coffee, adding they can add up to a 40-50 percent increase in profitability for companies in some cases. (For more with Coffee on the social machine and other M2M-related topics, see the Corner Office section of this magazine.)

Jim Wert, general manager for the deviceWISE M2M platform at ILS Technology LLC, a 12-year-old IBM spinoff, adds that com-

It's now possible to collect and analyze data so businesses can reach and do product design proactively rather than reactively.

panies typically start out with relatively simple M2M applications. Restaurant Technologies Inc., for example, wanted to monitor the amount of oil used in fast food restaurants. Now they do that and they also collect quality data on fryers and resell that data to fryer manufacturers so the manufacturers can see how their products are being used, do proactive selling, and leverage data to optimize the next generation of equipment.

When the topic of the cloud arises, another common discussion that comes up has to do with what equipment and smarts should reside within the cloud and what – if anything – to put at the customer premises.

Axeda's Zujewski says it doesn't always make sense to put all M2M-related data within the cloud of the service provider. The best place to store sophisticated and pattern analytics may be at the customer site, he says, because data warehouse analysis is sometimes so unique to a customer's business that it's difficult to provide an off-the-shelf solution in this realm.

As for the placement of network equipment in M2M applications, Viewbiquity CEO Tom Shafron says the M2M hosted service his company offers acts as a central nervous system, and that the apps are executed in app servers that can be deployed anywhere – at your data

centers or theirs. The service also relies on edge gateways, which sit at each customer premises to compile data from multiple M2M devices and send that data to the app server, which contains the intelligence to read the data. Because the edge gateways have to go at every premises location, it's important for these boxes to be pretty basic, allowing for more flexibility and lower costs.

He adds that the Viewbiquity cloud architecture means that app servers can be located closer to customers or data centers to allow for lower costs, more centralized control, and less latency. Controlling latency is important, he explains, because it impacts the kind of applications that can be supported.

If, for example, an enterprise wants to get data from sensors remotely, just a millisecond of latency can add up when multiple devices are involved, he says. That can be too long for an application requiring real-time results to be successful. **M2M**

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M2M Lacks Cross-Industry Harmonization, But New Effort Could Change that Tune

For all the talk about M2M these days, there's been very little work in this area relative to creating reusable platforms, and aligning protocols and other technologies, to help simplify application creation and otherwise lower costs and increase time to market.

That means that despite plummeting device radio costs, the availability of cloud-based M2M solutions and expansive wireless networks – all of which have made M2M more accessible to a greater number of potential users, getting M2M applications up and running has been more costly and time consuming than it would be were there M2M standards in place.

Perhaps that's because various industries are concentrating their efforts on specific M2M requirements within their verticals. It may also be in part because the big consulting companies are making hay doing custom M2M jobs. Or it may just be that it's still in early days for M2M, and only when a technology realizes critical mass, or critical potential anyway, do people start to really pay attention and start working together to figure out how to drive an industry forward faster.

Whatever the case, a large collection of important players in the communications arena have recently come together to tackle M2M harmonization through an initiative known as oneM2M.

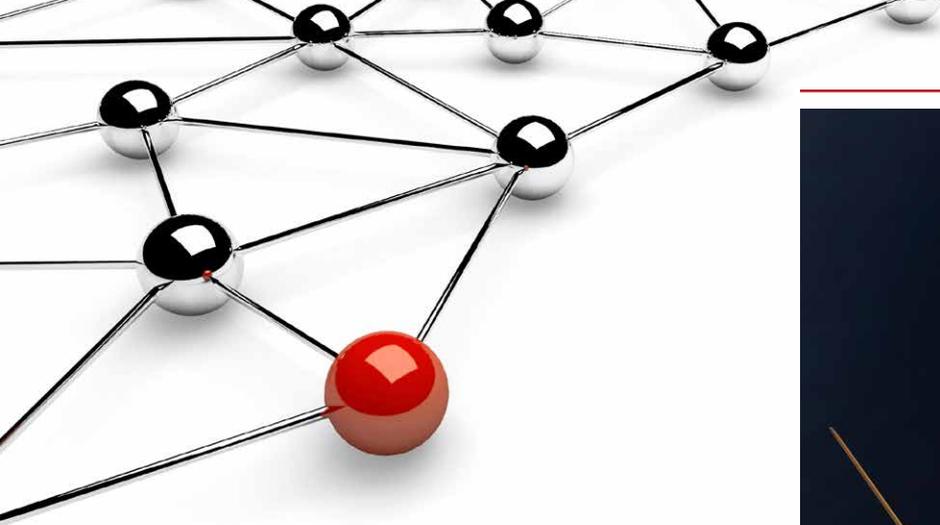
Founding member entities of oneM2M include the Association of Radio Industries and Businesses (ARIB) and the Telecommunication Technology Committee (TTC) of Japan; the Alliance for Telecommunications Industry Solutions (ATIS) and the Telecommunications Industry Association (TIA) of the U.S.; the China Communications Standards Association (CCSA); the European Telecommunications Standards Institute (ETSI); and the Telecommunications Technology Association (TTA) of Korea. "The specifications developed by oneM2M will provide a common platform to be used by communications service providers to support applications and services as diverse as the smart grid, the connected car, eHealth and telemedicine, enterprise supply chain, home automation and energy management, and public safety," according to a oneM2M press release announcing the group.

Representatives from each of these organizations gathered in July in Bellevue, Wash., to kick off the effort, which as part of its initial work aims to "confront the critical need for a common M2M Service Layer, which can be readily embedded within various hardware and software, and relied upon to connect the myriad of devices in the field with M2M application servers worldwide." The overall work of oneM2M is intended to lower operating and capital expenses, shortening time-to-market, creating mass market economies of scale, simplifying the development of applications, expanding and accelerating global business opportunities, and avoiding standardization overlap for M2M across industries.

Richard Brennan, a telecom industry veteran and current consultant with Telxxis LLC (TIA), explains that the M2M space has many vertical industry efforts related to M2M harmonization, but to date has lacked any umbrella standardization efforts. OneM2M aims to change that by creating a platform that acts as a middleware of sorts to enable developers to write an application once and have it work on any kind of network and within any industry vertical, he says. This concept is akin to the write once, run anywhere philosophy popularized by Sun Microsystems with its release of Java.

David Foote, CTO of Hitachi Telecom and vice chair of the oneM2M Steering Committee, says that because needs in different verticals vary somewhat, there won't be complete harmonization on M2M, but that defining a common way to implement M2M traffic on a carrier network clearly makes sense. So, again, the goal is to harmonize the M2M service layer, which is how a telecom service provider exposes services in its networks to devices or services or apps in the cloud or to customers. That will involve defining an API or signaling mechanisms that app developers can use to be access to network resources, much as developers do when putting together smartphone apps.

Brennan, who spoke with M2M Evolution in mid December after having just returned from a oneM2M gathering in Beijing, says among the first orders of business for the group is to survey use cases brought to members organizations and to look at the existing body of standards work at the member entities to understand key M2M user requirements and what oneM2M can leverage from existing standards. Foote says that if oneM2M can identify that 30 to 40 percent of industries need certain things from the network for M2M, for example, that would be helpful. The survey is expected to be



complete by the first quarter of this year, Brennan says, and the first outline of specs, requirements and key architectural consideration should be out in late 2013.

KORE CEO Alex Brisbane says that while the oneM2M is doing noble work, he believes it will be eclipsed by the speed at which people want to deploy and will use existing solutions from companies like Axeda.

While oneM2M works on the middleware/service layer part of the equation, Foote says that groups like 3GPP and 3GPP2 continue their efforts to define how a mobile network adjusts the control of calls for M2M devices vs. smartphones. That's important, he explains, given M2M devices typically require only very short connect times and very small data transmissions while smartphones tend to have lengthier and more bandwidth-loving interactions with the network.

M2M device discovery, configuration and management is another area that could benefit from harmonization, Foote adds. And there is plenty of existing standards work that could be leveraged in the process, he indicates. For example, he says, the M2M industry could potentially borrow from the Broadband Forum's TR-69, which came to light long ago to address the hairy issue of DSL turn up and management, and the Open Mobile Alliance's device management specs, which are now in widespread use.

"What you're going to see is sort of a cross pollenization of these specs and standards," says Foote.

Joel Young, CTO and senior vice president of R&D at Digi International, says that on the device side one of the biggest challenges of M2M, which standards won't solve, is there are lots of devices out there today that speak obscure protocols and not web services and have been out there a long time and will be out in the world for a long time still. That said, he adds, there will always be a need for the ability to translate those obscure protocols, which is something Digi enables with its gateway solutions.

There are trillions of dollars of devices out in world that won't be changed for decades, and that we want to tie into, and you have to get down and dirty to work with them, adds Tom Shafron, CEO at Viewbiquity. Shafron says View-

biquity leverages multiple existing standards and integrates them into JSAN and XML to significantly lower the cost of M2M implementation.

As discussed in this month's cover story, probably the most interesting piece of the M2M puzzle is how the M2M data, once it's generated and gathered, can be channeled into back-end systems so organizations can leverage that information to meet a particular end goal. Of course, it's important that such data is in the proper format so it can populate databases and be combined with other information as needed.

Peter Coffee, vice president and head of platform research for Salesforce.com, says to enable all that to happen the industry should try to get away from binary data interchange protocols, and move toward more xML and the hierarchy of name space. That is the way we are already headed, he says, but the history of M2M will require determination to move from binary protocol to name spaces and semantic protocols. **M2M**



by Paula Bernier

NETGEAR Expands to Address the Smart Home

Noting that mobility and the cloud are the new driving forces in communications, NETGEAR in January at CES unveiled a cornucopia of new and improved products addressing the connected home. CEO Patrick Lo says that while No.1 Wi-Fi home networking vendor NETGEAR in the last 10 to 15 years has focused heavily on connectivity in terms of speeds, feeds and expanding the range of connectivity, the company today also wants to enable Internet connectivity to everything in the house that is powered by electricity in an effort to help people have more fun and be more successful. And it wants to do that in a way that allows for simple installation and control by the average consumer.

A small, portable camera called vuezzone is among the products NETGEAR unveiled at CES to forward that strategy. The wireless camera, which fits in the palm of a hand, can enable consumers to use their wireless devices or a web browser to see that their kids made it home safely, their pets are ok while they're away, or their baby is asleep (or awake) in the nursery.

VueZone costs \$129.99 and is available now. Because it's small and doesn't require Ethernet cables or power plugs, vuezzone can be easily installed and moved as needed, notes David Henry, vice president of product marketing at NETGEAR.

"It's completely wire-free, which means it's hassle free," he adds.

The cameras are powered by camera batteries, which last about six months. The cameras can take video or snapshots. What's more, if the cameras sense motion, users can opt to receive

automatic e-mail notifications as to what images they capture at those times. NETGEAR also announced Vuezzone Night Vision, which won a CES INNOVATIONS 2013 award.

The vuezzone solutions store all images securely in the cloud. And there are lots of mounting solutions available for vuezzone, including an outdoor mounting solution with a weatherproof enclosure.

Commenting that there are expected to be 2 billion smart-phones in use in the next few years and that NETGEAR previously announced Push2TV technology, which pushes computer content so users can view it on their TVs, NETGEAR at CES also revealed a new version of Push2TV that is compatible with mobile devices that support Miracast, the peer-to-peer wireless screencast standard developed by the Wi-Fi Alliance. That means Push2TV works with Google Nexus 4, LG Optimus G, Samsung Galaxy S3, Sony Zperia T & TL.

Also at CES, NETGEAR came out with a Wi-Fi extension solution that operates simultaneously in the 2.4 and 5GHz frequencies. The product is called the Dual-band Range Extender. It's available now and costs \$99.99.

And NETGEAR revealed it's adding beam forming to its 802.11ac products, which as a result can discover and target connectivity to Wi-Fi-enabled devices, doubling their performance at long range.

Also new is NETGEAR's D6200 ADSL modem router, which delivers connectivity speeds of up to 200mbps, includes a USB port, is AirPrint compatible, supports the genie mobile app, allows for printing and storage, and offers parental control features. Available starting in April, this product will be offered for \$199.99.

NETGEAR's new NeoTV MAX is another CES 2013 INNOVATIONS award winner. This box, which sells for \$49.99 to \$69.99, can be held in the palm of a hand, features a built-in Slingbox player to record TV content and play it on wireless devices.

NeoTV PRIME with Google TV, meanwhile, integrates live TV, apps and the web (and includes a full Chrome browser, and supports FLASH and HTML5). It sells for \$129.99. **M2M**



Cisco Introduces Videoscape Unity

Cisco at CES unveiled a solution called Videoscape Unity, which expands on the Videoscape capabilities it announced at the Consumer Electronics show in 2011.

The original Videoscape was introduced to address the new video trend and transform the TV experience by allowing customers to access both the traditional content they're used to, as well as subscription-based programming, including content from over-the-top providers, and DVD movies and programs. In describing this at CES 2011, Cisco showed a TV screen with an interface categorizing the various content types as well as a "friends feed" that displayed video messages from others as those messages arrived.

The new Videoscape Unity, which leverages technology that Cisco got through its NDS acquisition, offers enhanced cloud capabilities and the ability for a branded client, explained Jesper Andersen, senior vice president and general manager of the service provider video technology group at Cisco. Marthin De Beer, senior vice president of Cisco's video and collaboration group, added that the electronic programming

guide of Videoscape Unity also allows users to navigate all kinds of media (TV channels, YouTube, social media) by content type and/or personal preference. And the solution's cloud DVR functionality enables users to access content from any device, even if they missed the airing of that content.

Cisco representatives used an iPad and then a Droid smartphone rather than traditional remote controls to navigate content via the Videoscape Unity interface. And they noted that users of the solution get a good viewing experience no matter their device screen size or resolution.

The company also provided a look into how this solution could be used in the future, meaning about a year from now. De Beer said OLED and large displays could allow for immersive content walls in our living rooms. And he showed such an experience, which included video of a sports event, player stats, a social media feed and other content. Cisco also used a wireless device to photograph a bar code on a product in De Beer's hand, and said that by doing so the consumer could be provided with related product information. That could include things like how-to videos, but it also would open the door for service providers like telcos to offer retailers the ability to target consumers with related products. **M2M**

LG Shows Smart Home Solution

The smart home was also center stage for LG Electronics at CES. At the event, the vendor showed its Smart Home Service, a 2013 CES Innovations Award winner. The solution leverages media sharing capabilities of SmartShare with the integrated home appliance management of SmartControl, enabling users to do things like start their laundry, check what's in the fridge, or have the floor vacuumed, all while they're away from home, according to Reuters.

"The Smart Home Service is a perfect example of LG's commitment to bringing true technology convergence into the consumer's home," said Dr. Scott Ahn, Chief Technology Officer of LG Electronics. "SmartShare offers a variety of ways to share digital content between devices. SmartControl lets the user take charge of their LG home appliance and entertainment products from a single location using the SmartControl application for smartphones and Smart TVs."

SmartShare uses one-touch NFC tagging to transfer media content among devices using WiFi or 3G/4G, according to Reuters, noting this allows for easy sharing of photos, videos and other content stored on a smartphone or laptop with LG Smart TVs. **M2M**



by Bob Emmerson

M2M Does 3D-SiP

3D-SiP (System in Package) is a relatively new development in the M2M space. The 3D part refers to the fact that components are placed on the top layer of the stack (x and y direction) and passive components are also embedded in other layers (the z direction). The objective is to minimize the size of the module and thereby facilitate the creation of new solutions such as GPS-enabled smart watches.

Employing PCB stacks is not new. In regular 2D architecture, components are only mounted on the top, and the other layers are used for the interconnection tracks. When the top stack is very small, it's impossible to connect all the components. This is realized by drilling vias (the high-tech term for very small holes) through the boards, which are copper plated, and the construction is then wave soldered.

In a 3D architecture, there are fewer components on top, but the same or similar interconnections are employed.

Regular module construction involves drilling small holes through the copper foil tracks and the PCB. Layers are interconnected by copper plating on the holes of each layer. Telit's 3D proprietary manufacturing process does not involve drilling or plating, and therefore it is more efficient and eco-friendly, since toxic chemical, water and electricity consumption is reduced.

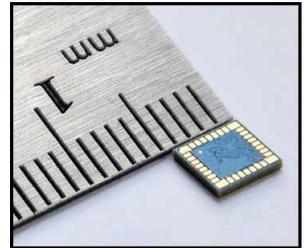
Other substrates and interconnection techniques can be employed as well. For example, AACMicrotec uses vertically stacked wafer substrates and thin-film deposition for the electrical connections. It's worth paying a visit to the company's site to see how it works.

The stated benefits of the 3D architecture are faster transfer of information, less crosstalk, better heat conduction and simplified manufacturing. In addition, because they are smaller and lighter, 3D modules are less affected by mechanical vibration and acceleration.

As far as I could find out only one vendor, Telit, is marketing a 3D module. Known as the Jupiter SE880, it's a GPS solution whose form factor is a mere 4.7 x 4.7 mm (0.185 x 0.185 inch), which means the module could sit comfortably on the finger nail of a small lady's small finger.

Incredibly small dimensions allow this module to be deployed in GPS-enabled consumer devices such as smart watches.

Desmond Wong, Telit's manager of business development and advanced technologies,



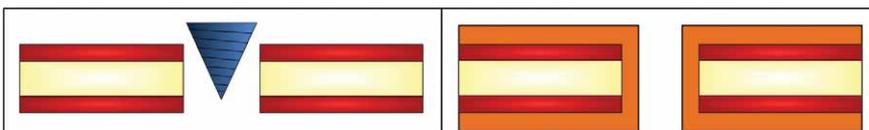
says Telit and a PCB manufacturer spent over a year developing the technology required to optimize the off-the-die circuitry without drilling holes and copper plate the vias. The SE880 is a shipping product.

Telit has boosted its GPS performance by using a state-of-the-art RF frontend. Spatially calibrated waveguide-quality radio paths inside the three-dimensional space of its architecture are used to minimize RF noise, which impacts on GPS performance. Enhancing maximum sensitivity in this way enables a much lower TTFF (time-to-first-fix) under standard operating conditions: as much as 200 seconds quicker from a cold start.

Enhanced sensitivity also allowed Telit to dispense with the traditional GPS antenna. Instead, the company employs a printed antenna that is embedded in the PCB, minimizing the size of the GPS receiver.

Whether the technology comes from AACMicrotec or Telit or another module vendor, this is clearly a groundbreaking development. 3D-SiP opens a new era of performance, footprint reduction and modularization, leading to significant advances in portable electronics. **M2M**

Bob Emmerson is the European editor for TMC, the parent company of M2M Evolution magazine.



by Rich Steeves



Geotab's Fleet Management System Is Truly Plug-and-Play

It's no secret that fuel costs are rising, and companies are looking for ways to cut down on their fuel bills. Some are putting hybrid or electric vehicles in their fleets, and others are taking advantage of telematics technology to provide them with data to help decrease fuel consumption. But for companies that wish to implement both of these strategies, things have always been a bit tricky. Now, however, Geotab has developed a truly plug-and-play telematics solution.

Toronto-based Geotab has a decade of experience creating and deploying telematics technology for business fleets, and it is an end-to-end tech provider with robust hardware that is suited for a broad range of vehicles, including electric, hybrid, diesel and trucks. According to Colin Sutherland, vice president of sales at Geotab, the company's technology has the ability to understand the way each vehicle uniquely communicates, boiling down the information to a single report. It focuses on helping companies in a number of areas, including fleet safety, efficiency and compliance.

Suited to all types of engines, the Geotab solution has a tiny form factor that fits underneath the dashboard and works with reliable GPS technology. The solution helps fleet managers understand where fuel is being spent and how best to invest in their assets in the field. Managers can simply log into the software and create alerts or reports. The technology pays for itself early in each month, as it helps drivers adjust their habits, addressing behaviors such as rapid acceleration and speeding, to improve miles per gallon efficiency. An improvement of ½ mpg can result in a \$46 per month savings per vehicle. And achieving this change in driver habits is easy, as the technology can send an audio warning to drivers who are engaging in wasteful behavior, causing them to change their bad habits immediately.

The solution helps fleet managers in other ways as well. It can provide them with predictive maintenance warnings, letting managers know there is an issue before the vehicle's check engine light comes on. This allows managers to sched-

ule repairs in advance and cuts down on the number of spare vehicles in the fleet. It also helps them determine what materials they need to buy, from spare tires to batteries. **M2M**

Rich Steeves is a web editor for TMCnet, the online entity of TMC, the parent company of M2M Evolution magazine.

Car & Fleet Briefs

Olivier Beaujard, vice president of market development at **Sierra**, recently shared some 2013 M2M predictions with TMC, the parent company of M2M Evolution. Beaujard said he foresees a larger demand for streamlined M2M solutions in areas such as smart metering and connected homes, though he still sees the automotive market as the biggest driver of change. In the automotive space, he sees safety solutions as one of the biggest areas for potential growth as well as location-aware applications and infotainment. Overall, he feels that companies will seek out M2M solutions that will minimize total cost of ownership while increasing customer service.

Sprint has debuted a global, end-to-end solution for auto manufacturers. The solution, called Sprint Velocity, was highlighted at the recent LA Auto show in California. Sprint Velocity helps automakers integrate complex components and vendor relationships required to provide advanced connected services, including news, weather, sports, security, navigation, connectivity to mobile devices and emergency services, and engine diagnostics. It combines technical integration with Sprint's expertise in the wireless customer experience to help automakers generate new sources of revenue, economize on cost and develop better relationships with customers. Auto manufacturers can use Sprint Velocity as a turnkey solution or on a modular basis. Sprint will act as a mobile integrator, outfitting automakers with an open, modular and agnostic network platform.

Volvo Group and **Ericsson** have collaborated to deliver infotainment and communication services in the new Volvo cars. Ericsson is offering systems integration services related to Volvo Car Group IS/IT environments and in-vehicle systems. Ericsson is expected to provide managed services for a global cloud solution featuring a secure connection between vehicles, content providers and others. Lex Kerssemakers, senior vice president of product strategy and vehicle line management at Volvo Cars, says, "We clearly see that cars in the near future will integrate the same level of digital services that consumers today are used to hav[ing] in their homes or at work."



by Paula Bernier

The Medium is the Message

Digital Signage Pops Up in New Places, New Ways

Digital signs have long been a fixture in sports venues and transportation hubs. But, increasingly, they're turning up in retail environments, restaurants, and other businesses and operations. While early digital signage deployments tended to involve single monitors and rely on PC technology, newer deployments may include interactive touchscreens, multiple screens and more advanced back-end operations.

Hardware supporting digital signage such as media players, PCs, displays and LED video arrays generated nearly \$5.5 billion in revenue during 2011, according to IMS Research. The IHS Inc. company adds that it expects to see continued growth for this equipment at a combined compound annual growth rate of 8.5 percent through 2016.

LCD and plasma displays shipping worldwide for digital signage generated revenues of nearly \$2.7 billion in 2011, representing 22.5 percent growth over 2010. That was in part due to an increase in shipments for screens smaller than 30 inches, replacement of CCFL with LED backlit and thin bezel displays, as well as an increased demand for touchscreens. LED video display (or module) revenue grew as a result of increased investment in sporting venues and outdoor digital advertising.

"While screen sizes around 42 inches continue to comprise the majority share of screens, we expect sizes over 50 inches to increase to a 27 percent share due to increased usage in verticals such as airports and retail," says Shane Walker of IMS Research. "Smaller screen sizes are also experiencing increased uptake in the restaurant, education and hospital-ity verticals. These small screens increasingly have built-in media players with Ethernet or Wi-Fi connectivity."



BrightSign-powered column with 36 synchronized screens in the store in the departure lounge of terminal E2 at Charles de Gaulle International Airport

BrightSign is among the leaders in the media player space. These appliances generally sit right behind digital signs and accept and transform content for display on one or more signs, explains CEO Jeff Hastings. In wireless deployments, the devices leverage Sprint's networks.



The company provides its media players to enable TV walls at such retailers as BJ or Costco, adds Hastings, but it's also outfitted large displays at other venues, such as airports and aquariums.

Typically businesses buy and maintain the media players, but BrightSign does offer a SaaS-based service through which it will manage the device. This quarter, BrightSign and Sprint are partnering to introduce a BrightSign-branded service that will monitor digital kiosks.

While BrightSign does not help customers design their digital signage content, Hastings says the company's new XD player supports HTML5, which makes it a lot easier for content developers to leverage the HTML5 content they've already created for websites – although he adds that customers should avoid simply repurposing website content for digital signage use.

Hastings suggests that the most successful digital signage deployments are ones that encourage interactivity. That, he says, allows for more user engagement and longer usage time (2-3 minutes engagement when display is good and interactive). In fact, one BrightSign customer saw a nearly tenfold increase in sales after it launched operation of a digital sign in its store.

"That gives customers the ability to get a feel for the product before they take it home," says Hastings.

While the airport market is pretty well penetrated in terms of digital signage, penetration in other markets is less than 5 percent, Hastings estimates. However, he adds, we should be seeing more digital signage going forward, as prices for this gear drop and more businesses drive interest in these tools. In 2011, Hastings says, digital signage solutions, excluding monitors, sold in the \$2,000 range. Now, he adds, we're seeing solutions for below \$400.

The CES show this January also emphasized the growing interest in digital signage.

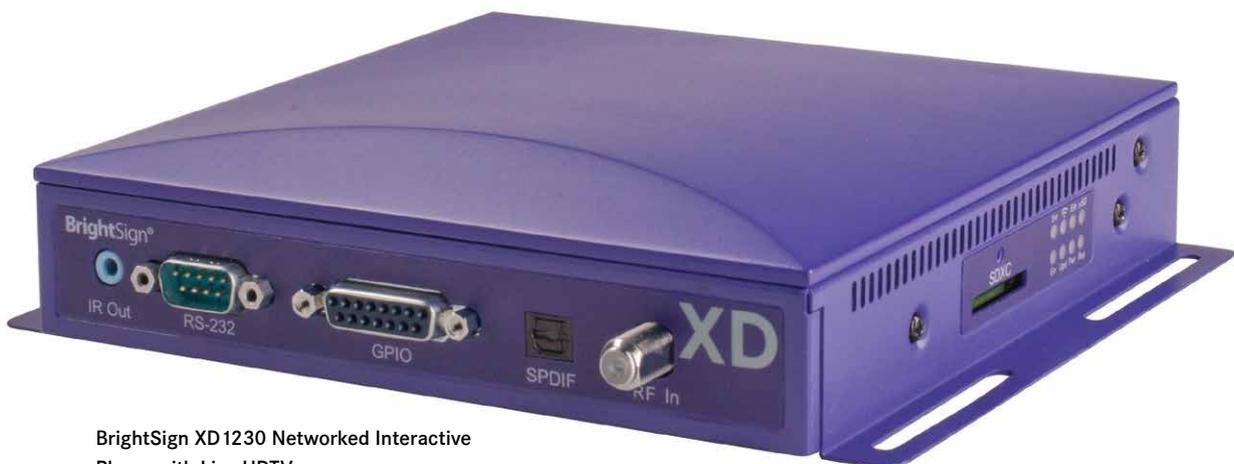
While much of the conversation had to do with the introduction of larger and higher resolution displays, Casio Signage at CES unveiled a digital signage-specific solution that pushes the concept of using characters to promote brand and product within retail locations.

"This will revolutionize storefront advertising" and prompt customers to enter businesses and purchase more while they're inside, Toshiharu Okimuro, corporate officer, senior general manager of the signage department at Casio Computer, said.

The multilingual solution is in the form of hardware and software about the size of a turntable. The shape of the character protrudes from the top of the box, which is available starting this month for about \$10,000.

Rather than relying on video, this solution creates characters from still images and text, which makes it easier to change content as needed to create new promotions for additional products or seasons of the year. This type of animation, however, is somewhat surreal. (Think the woman's head in the globe at Disney's Haunted Mansion.)

During a CES demo, Casio showed an example of its digital signage solution in use by a grocer, an actual person's animated photo discussing the unique offerings in the grocery store's bakery, butcher shop and produce departments. It also highlighted how the solution can be used to promote a business's products using animated characters – like a cartoon buffalo for Buffalo Wild Wings and a cartoon hamburger for burger place at Mandalay Bay at Las Vegas. **M2M**



BrightSign XD1230 Networked Interactive Player with Live HDTV

by Carl Ford

Fleet Management: It Moves a Village

Fleet management software was probably one of the first implementations of M2M. It's not surprising that many companies exist in this space when you consider there are more than 90 million trucks and 50,000 transport companies just in North America and the impact fuel costs have had over the last decade.

For many fleet management systems the goals were based on optimizing truck loads and route efficiency. Without the sensors, fleet management has included everything from mobile phone implementations to clearinghouses for trucks looking to add to their load. In many cases the solutions built have been focused on one measurable aspect: allowing fleet management companies to partner with many other companies to deliver a complete solution.

Functionality that once required human intervention has been surpassed, as smartphones, location-based services, and sensors deliver real-time feedback, more integration to the corporate work flow and back-end systems deliver productivity. However, as with earlier systems, the opportunity to partner is gigantic, as fleet management systems are often used to support and supplement systems such as asset management, field service, food traceability, inventory, logistics, supply chain and workforce management.

Know Your Measure

Many fleet management systems provide an ROI calculator on the web that allows you to evaluate the cost of the system. A few of them are built on costs such as gas and reduction of idle time, while some others aim to highlight the gained revenue from more goods delivered. While these systems have the benefit of being rooted in hard costs, the unit of measure may not translate well to internal values. Where does your company focus should be a starting point. For example, a shipping company normally values the overall efficiency of the packages moved, while a distribution center may value the dollars associated with the shipments.

Another place to start is what systems are used currently in the company. Some systems are considered core to management and by interfacing the fleet management to these systems you gain in two ways. The first is that it may reduce cost since there are many cloud-based systems these days that can be connected via APIs to the core network. The second is that by associating to the company's core system, the issues of updating and maintaining become more strategic, and therefore legacy maintenance becomes more manageable. Of course, embedded

in this analysis are the capabilities of the company's internal staff to manage these systems.

Finally, there are the issues of regulatory compliance, which are about to change as a result of new rules associated with the International Fuel Tax Agreement.

Routes Aren't the Only Thing to Optimize

Having surmised the internals of the measurement, the scope of the project can be daunting.

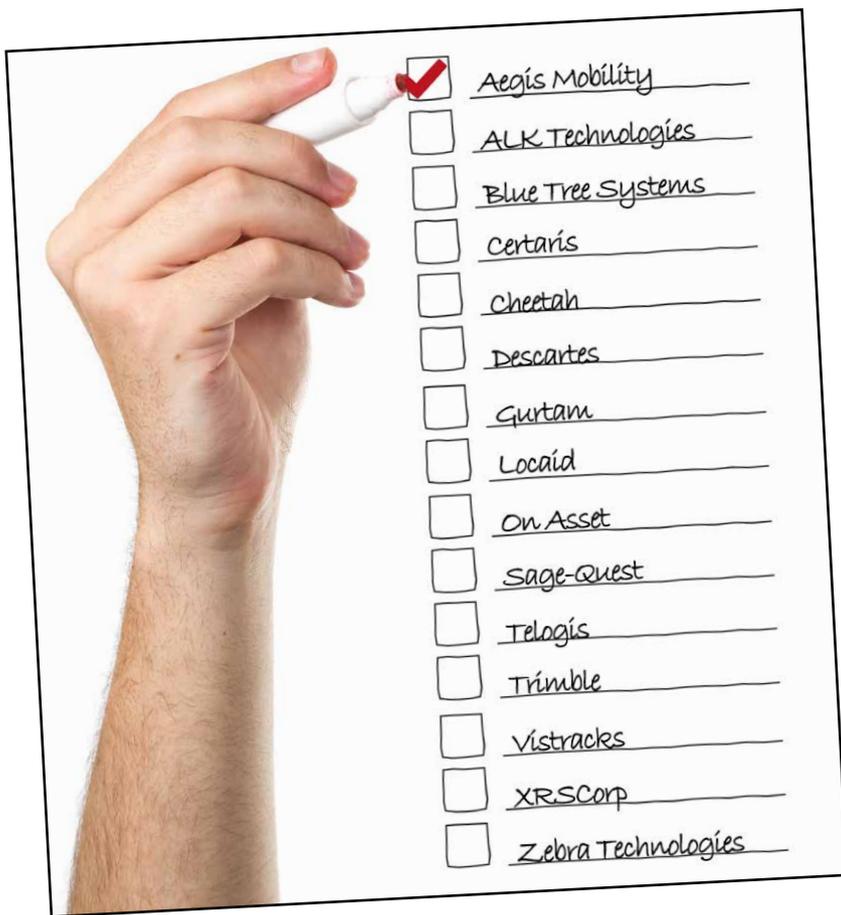
In these days of outsourcing, you may want to keep the costs down, but that should not preclude the gathering of as much information as possible. The reality is that more data is available and the cost of gathering, storing and utilizing this information is an order of magnitude cheaper than it was a decade ago. Analytics are evolving, and the more data you gather now the more likely you are to discover value later. Many companies are at a point where predictive systems are possible, which impacts fleet management.

Big data is a term used these days to represent the way storage of information is being optimized for flexible retrieval. The goal should not be to understand every way the system can be utilized, but to understand how to capture everything that is available and make it accessible in near real time.

If you have had systems in the past that have relied on the driver to input information, it's important to understand that many solutions today can deliver the information based on GPS, NFC, RFID, and other solutions make the driver more of an evaluator than a data entry point. Keeping the system fuzzy for evaluation and enabling all stakeholders the ability to access it in the long run will probably add to the productivity.

Choosing the Right Partners

Even if your company has limited the scope of its system to fleet management specifically, the evaluation process has lots of choices. At this point, I have counted more than 50 fleet management systems and many additional partners in the mix depending on the requirements. I will not pretend to understand every need nor that any one system is right for everyone, but associated with this article is a list of 15 companies that if you visit their websites



you will probably be on your way to a successful implementation.

The Fleet 15

I am listing these companies alphabetically but with a word of warning: The spectrum of fleet systems is wide, and I have left some good players, several larger players, and the phone companies off the list.

The goal of this list is to help you quantify your needs, but it does not represent all worthy of sitting and talking with about your business. It also does not represent all the abilities of the companies on the list, only the tickler to help you think about your requirements.

1) Aegis Mobility <http://www.aegismobility.com/distracted-driving/> If you are worried you are going to add so much data that the driver will be distracted rather than driving, you should start here to see how to provide the right information at the right time and right place.

2) ALK Technologies <http://www.alk.com/> If the goal is to get upper management on board and if you want to see what is possible with mobile devices, ALK's PC Miller and Co Pilot are good ways to navigate your way around fleet management.

3) Blue Tree Systems <http://www.bluetreesystems.com/solutions/> If agriculture, health or pharmaceuticals are

part of your mix, then the discussion of temperature management of your fleet of trucks is well represented here.

4) Certaris <http://www.cetaris.com/Home.aspx> If your problem is not big data but big machines, Certaris has experience with construction solutions that are probably relevant to you, and probably good for all who keep inventory for maintenance.

5) Cheetah <http://www.cheetah.com/> If the goal of your analysis is to take a segmented approach to how you implement your fleet management system, Cheetah modules give you the ability to look from trucks to couriers.

6) Descartes <https://www.descartes.com/> If you are using third parties to augment your fleet, the Descartes systems have the tools and metrics you want to understand how you can optimize those resources as well as your own.

7) Gurtam <http://gurtam.com/> If you took my advice seriously of looking to interface with your existing systems, this is the place to see where the API, the cloud and your team can manage the fleet.

8) Locaid <http://www.loc-aid.com/> Analytics can be further explored by looking here, and it can also be the place where understanding how many devices you have are addressable by their system.

9) On Asset <http://www.onasset.com/> If you want to see what's possible, On Asset Intelligence brings a visual mapping ability that includes access to big data. If your fleet is only part of the answer and involves air and sea, they also can guide you there.

10) Sage-Quest <http://www.sage-quest.com/home/default.asp> If you are looking to get the business case together, the Sage-Quest 2012 Buyer's Guide is a good document to read. The guide is also an indication about how good the company is at optimizing the fleet.

11) Telogis <http://www.telogis.com/> This is a place to get a good handle as to what is possible if you are looking to manage your fleet maintenance effectively. Additionally, the new Telogis Fleet 10 has features that monitor driver safety.

12) Trimble <http://www.trimble.com/gps-fleet-tracking/> has the advantage of being a cradle-to-grave implementation including a carrier partner. Looking at Trimble is a good starting point or a good place to go over what you have done to see if you missed some opportunities.

13) Vistracks <http://www.vistracks.com/Home.aspx> Two things you should focus on when looking at Vistracks are real-time feedback functionality, and the ability to use its API.

14) XRSCorp <http://xrscorp.com/> You may know this company as Xata. It is well known for its dispatch tools and dealing with the issues of managing less than truckloads. These systems are designed to work with smartphones and tablets today.

15) Zebra Technologies <http://www.zebra.com/us/en.html> This is a case where the component of the fleet management system is worthy of separate discussion, as Zebra Technologies gives a tutorial on where to tag and what systems are available.

Even at 15, many companies have been left off that you may want to look at. If you come to our Resource Center <http://www.m2mevolution.com/> you can see the hundred others that have been left off, only for the reason that our goal was the focus your requirements at this point. If you want more insight as to what we learned feel free to email me at carl@crossfiremedia.com. **M2M**

Carl Ford is co-founder of Crossfire Media (www.crossfire.com), a TMC partner that puts on the M2M Evolution Conference & Expo, which takes place next in Miami.





Join Us in Miami

This Jan. 29 through Feb. 1, thought leaders, enterprise executives and analysts will converge in Miami at the M2M Evolution Expo to discuss how the Internet of things can be leveraged by businesses of all types. The M2M Evolution event will show attendees how to utilize M2M technologies in enterprise business applications including supply chain management and mobile workforce, smart home and smart building, energy management, mobile health care and more. Members of the M2M ecosystem, including wireless carriers, application providers, platform companies and device manufacturers, will also discuss their roles in creating effective technologies and procedures that work to create solutions for actionable data, information and efficiencies. "There is no opportunity better for CIOs and CTOs to send their team members to a technical conference that covers all aspects of M2M and cloud applications than this conference," notes Nikki Cuban, vice president of marketing and business development at OnAsset Intelligence. "While I have participated in many conferences and events that currently exist [for M2M], none have been as rewarding as the M2M Evolution Conference."

Ready for Battle

The second Battle of the Platforms is to take place at the upcoming M2M Evolution in Miami. This event, which is slated for 2 p.m. on Jan. 29, is a free day of M2M programming that consists of a cocktail reception and sessions from analysts, real-life case studies and roundtable discussions on new M2M technologies and best strategies. This offers M2M application developers, wholesale service providers and others the chance to evaluate market-leading M2M solutions. The platforms represented at Battle of the Platforms include: smart energy, including smart homes and buildings, end-to-end energy management, smart metering and more; health care, which includes M2M-enabled medical applications, and M2M medical devices and hardware; enterprise, which includes asset tracking, facilities management, mobile workforce management and more; and service provider, including customer experience management, the emerging role of OSS/BSS systems in the M2M value chain and much more. M2M Evolution Miami 2013 is sponsored by ILS Technology, Spireon, Vodafone, Verizon, Axeda, AT&T, ThingWorx and Wilson Electronics Inc.

Shrinking Science Fiction

Working with the crowd-sourcing site Kickstarter, MEA is looking to fund the next generation of its Wi-Fi controller. The device, known as the iGloLED controller, uses a simple http command interface so developers can access the hardware through a web browser or a programming language such as Java. As of late 2012, the Kickstarter campaign was looking to raise money for a 12 Volt controller, which will have an SDK with example code. The target price for the 12V iGloLED is \$99, which is about a third of the going price for similar devices. The project features options for Windows, Android, iPhone and BlackBerry. "iGloLED will accelerate development in the machine-to-machine space," says Bruce Seymour, managing director at MEA. "Science fiction is now in your palm. In the future our controller will be able to be used with next-generation products such as the shatterproof, plastic bulbs recently developed at Wake Forest University in North Carolina."

Staying on Track

Georgia-based electrical contractor Brooks-Berry-Haynie is using telematics solutions connected to the Sprint network and using the ActSoft tracking device. The solution relies on a CalAmp 2610 embedded antenna to provide GPS and other driver behavior and location information to BBH management. The geofencing application proved valuable recently when a BBH truck was stolen from the company's lot in Mableton. The tracking unit immediately alerted the company that the truck was stolen. BBH shared data with police and within hours the vehicle was found in a ditch with minimal damage.

Keep the Meter Running

Digicom will use Telit Wireless Solutions M2M modules to enhance T-LOG, its meter-reading device for water, gas, and LPG. The integration of Telit's ATEX certified variant of the GE864-QUAD module into Digicom's T-LOG device enables measurement of consumption pulses from meters via pulse-receivers and an 868MHz radio transceiver. This data is then sent through SMS, GSM/GPRS or TCP/IP connections. The device, which can easily read up to two counters featuring pulse emitters, can also be remotely configured and managed.



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Big Blue Helps Wade through the Sea of Data

Carl Ford of Crossfire Media and the M2M Evolution magazine advisory board recently spoke with Jerry Coumo and Gari Singh of IBM about Big Blue's views on machine-to-machine solutions, including MQ Telemetry Transport (or MQTT), a lightweight publish/subscribe protocol flowing over TCP/IP for remote sensors and control devices through low bandwidth, unreliable or intermittent communications.

Coumo commented up front that something like MQTT could really make M2M work efficiently but wouldn't alone do the job. It would need intelligence behind it. "It's the combination of that with some of our analytic capabilities that really make this very interesting and compelling for IBM," he said. And here's the rest of the interview.

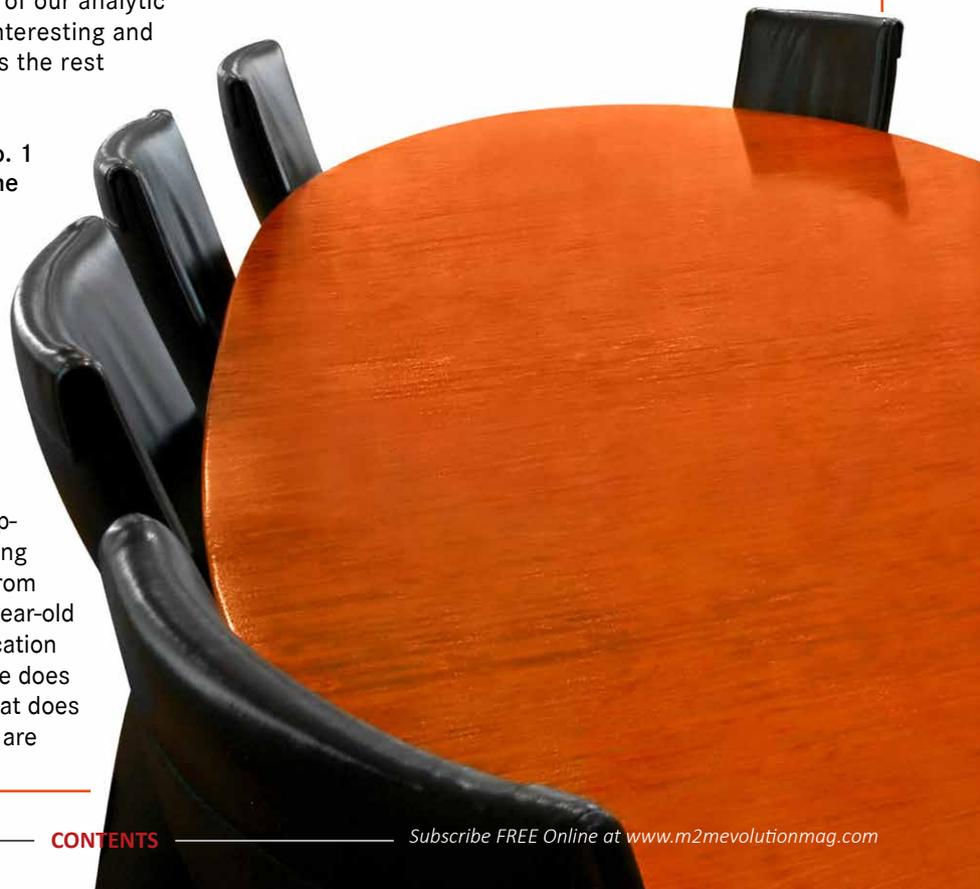
CF: In the Java World you were Sun's No. 1 supporter in building Java. Has this come anywhere near Java embedded?

JC: It's funny you even asked the question. I had to stop and think about it. How else you would do it? Of course we like to lead with Java first, and we have ways to utilize MQTT from Java. But we also want to make MQTT really pervasive so we also made it quite friendly with JavaScript as a way to program these things. JavaScript is a kinder gentler Java. It tends to be more appealing to a larger audience. You're building these applications that are getting data from devices and all that kind of stuff. My 17-year-old son, as an example, wants instant gratification and wants to muck around with things. He does a Google search to find a code snippet that does something. So to cater to the masses we are

making sure that this stuff is not only available in Java but also in just about everything else.

CF: With M2M, are there network I/O concerns from your perspective, as the \$6-billion WebSphere world suggests it sounds like there is? Tell me a little bit about that. Are you going to be building massive analytics?

GS: I always frame things in simple questions. So you have big data and I ask the question: Where does big data come from? We talk about processing the data, but where does it actually come from? There is an opportunity to drive big data with big messaging. The opportunity out there is...we have all these devices and if you consider the fact that you have 3G and 4G but ubiquity of TCP is the game changer, I think that's what allows us to do everything. You can get all kinds of data rate from all kinds of devices whether it's locations, cars sending you data. All that type of stuff can drive massive amounts of data. We actually work on two interesting parts I think within IBM on the back side. One is: How do you consume all that data and buffer that data to get it to the right applications?



One of the things that big messaging is doing is adding some level of intelligence to the data coming in, by tagging it, correlating it with the other things passing through.

That has been the focus of what I've been working on in terms of high-scale messaging infrastructure for pub/sub eventing, because eventually all this stuff is eventing. And on the other side we have a couple of different technologies for doing processing. Things like Hadoop, big insights, and big analytics products for big data. We also have some other interesting technology, which is a kind of a streams processing technology where we can actually do analytics on the big streams of data as they are in motion. So you can start to imagine that I'm getting big volumes of sensor information – cars reporting their information; people reporting their information; and I actually want to detect instantaneous response based on some correlation of events or analytics. Those are the interesting things that we

found and are working on, and when we talk to customers about this they are saying that makes a lot of sense. We've actually found a number of customers

who have that need even though they did not quite state it that way. So big messaging and big data equals big analytics.

CF: Does this mean we are we heading toward predictive systems? Is that a possibility when you listen to the streams?

GS: Exactly. Predictive analytics. That's what we can do, and it's pretty interesting.

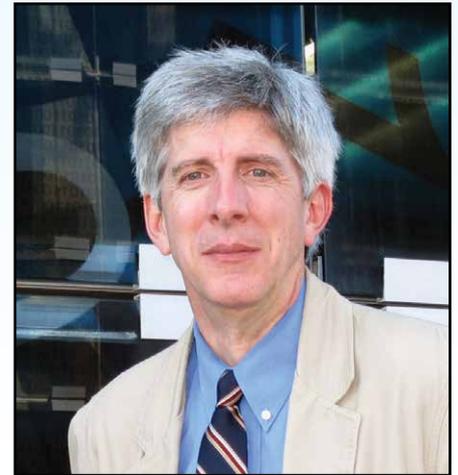
JC: The more data, the closer you are to making sense and gaining insight of what's happening. Some of the things that Gari is mentioning are pretty key. One of the things that big messaging is doing is adding some level of intelligence to the data coming in, by tagging it, correlating it with the other things passing through. So it's almost doing a pre-process of analyzing the

data, almost in the network as it is being delivered as it is arriving into the raw data pool with some level of interest. Simple, very simple, but powerful things that we are working on are telemetrics types of things and location technology. Location services is a pretty popular thing and at the root of a lot of these use cases. You are doing a geo-fence and you're saying: Is this thing inside the geo-fence or outside the geo-fence? You can tell the messaging system don't just deliver me this data, tell me if this

data is inside or outside this point. This could help quiet the noise because even though we want every message from every device that we can get our hands on, we also want to be able to preprocess the data preferably in the network. Then when we get the predictive stuff it's much more targeted; it's not [about] looking through a sea of information. It's narrowed the information down toward the subject matter at hand. It makes it much more efficient. It's also efficient from the optimization of time, space, storage. **M2M**

Coffee Talk about the Social Machine, M2M and the Cloud

The use of machine-to-machine technology as a way to connect devices and collect data is growing in importance. But data collection is just one part of the equation needed to add up to value for businesses and consumers. Identifying the useful data, ensuring that data is in a usable format, and then combining that data with other information in a meaningful way are also key aspects involved in enabling M2M to reach its promise, as is the use of cloud-based solutions. M2M Evolution recently interviewed Peter Coffee, vice president and head of platform research for Salesforce.com, about all of the above.



The social machine – which is discussed in this issue's cover story – is a term that has recently become popularized. What is the social machine?

Coffee: Social is a set of behaviors. Think of someone who's anti-social, and then ask what would make them nicer: they'd be more sensitive to why you're asking a question, they'd be aware of your past behavior in offering you what should be useful assistance, and they'd recognize events that represent opportunities to reach out to you with information or aid. Now realize that these are behaviors we can build into algorithms as well as attempting to develop in people.

A social machine uses sensors, network connections, social graphs, and algorithms of the sort that we used to call AI to create customer delight at scale, with consistency and rate of improvement and cost effectiveness that can't be accomplished with people alone.

Socially Connected Enterprise combines social behavior with security, reliability, consistency, and productivity through

process integration; it delivers these things cost effectively through the massive efficiencies of the cloud computing operations model.

What does the social machine have to do with M2M?

Coffee: Information grows more rapidly than the bandwidth and comprehension of people. For example, nearly half of the phone calls to GM's OnStar service are initiated by the car, not the driver. This ratio will grow. Connected devices will overwhelm with raw data, but they can serve and even delight when that data is mediated by social algorithms and process designs.

As we make connectivity happen, now we're no longer keeping all the IT internal; much of the business intelligence goes into cloud. Where do you make the break? What does it make sense to put on premises and what in the cloud?

Coffee: During the six years that I've been with salesforce.com, the boundary between what made sense to own/operate and what made sense to service/

subscribe has constantly moved in the direction of more things making sense not to own. I recently saw an elaborate Monte Carlo analysis of IT workload that a major company did to convince itself not to make a move toward cloud capability. My comment was: It's a fatal error to optimize while your competitors revolutionize.

What else does the cloud offer in the way of added value?

Coffee: Cloud is access to externally originating data. Cloud is ability to accommodate enormous peak-to-average ratios. Cloud is ability to spin up a Hadoop big data engine as casually as a spreadsheet, enabling owners of data or operators of business units to own the initiative in finding new business value. If you say: We could do this ourselves, of course you could. But will you do it? With what people? With what expensive mistakes? With what crippling ongoing costs? With what sacrifice of innovation, as cloud services get upgraded three times a year while owned/operated infrastructure is only upgraded every few years at daunting cost and technology risk? **M2M**



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by Rich Tehrani

We Are All Connected – And, Increasingly, Our Stuff is Too

I'm at the CES show as I write this, and machine-to-machine solutions are out in full force here in Las Vegas. This reflects the fact that the world is becoming increasingly connected. Not only are we tied to one another and a wide array of media via our computers and phones, but – more and more – our other appliances, businesses, homes, vehicles and, in some situations, even our sensor-equipped bodies – are becoming connected.

As you're probably already aware, this movement toward connecting virtually all things has become known as the Internet of things. And it's becoming so central to our industry, and soon to our very existence, that TMC decided to expand its M2M Evolution efforts to also include this quarterly publication, which will appear both in print and online. The magazine will provide details on important new developments in the M2M space and help you understand how you, your home (or the homes of your customers) and your organization (or the businesses of your customers) can benefit from machine-to-machine technology in the near and long term, challenges you may face, and solutions you might consider. The publication will offer news, opinions, multisource articles and case studies.

But, for now and in this space, I'd like to provide a quick rundown on the M2M-related news and commentary coming out of CES.

On the connected devices front, Samsung came out with new cameras that allow users to instantly share photos without plugging in. And a wide variety of companies showed new TVs and video entertainment-related solutions enabling such functionality as more realistic viewing experiences, any device anywhere content consumption, and the ability to share and sync content among multiple devices.

On the smart home front, AT&T at CES announced plans to commercial launch AT&T Digital Life in eight markets in March. This is digital, wireless service that enables users to leverage

their smartphones, tablets and PCs to track and control their home security and heating and cooling systems, and their home appliances. The service – which is sold in a modular fashion and can include home security cameras; window and door sensors; carbon monoxide, smoke, motion and glass break sensors; thermostats; and more – is supported by round-the-clock staffed monitoring centers, which alert local fire and police departments, and end users, in the case of an emergency.

LG Electronics was also at CES with its Smart Home Service. The offer combines the company's media sharing solution with integrated home appliance management capabilities, which LG calls SmartControl. It can enable people to remotely start their washer, peruse the refrigerator, etc.

NETGEAR also announced that it is addressing the connected home.

The connected care was also a hot topic in CES, as it is in the industry at large. As M2M Evolution magazine's Paula Bernier has reported, Lexus at CES held a press conference to announce that it's working on building more intelligence into its vehicles to increase safety in a world in which there were 32,000 U.S. traffic fatalities in 2011. While Toyota, Lexus and other automotive companies already have come a long way in advancing technology to allow for a safer driving experience, Lexus management noted additional work on the safety front is taking place at special facilities called TRINA in Ann Arbor, Mich., and the ITS Proving Ground in Japan.

Ford, which a few years ago at CES unveiled a solution that enables smartphones to synchronize with car dashboards to provide drivers and passengers with information and appropriate entertainment, was also at CES promoting its connected car offerings, upon which it continues to improve. And Ford at CES this year unveiled new developer kits to encourage the creation of new applications for use within cars and trucks. Additionally, Ford's CTO was part of the keynote by Lowell McAdams, chairman and CEO of Verizon, at CES.

Of course, these consumer applications of M2M technology are just part of the story. The possibilities for using M2M in business-based applications are endless. And you'll learn about both in these pages and subsequent issues of M2M Evolution magazine, as well as at our M2M Evolution Conference and our online portals. **M2M**

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