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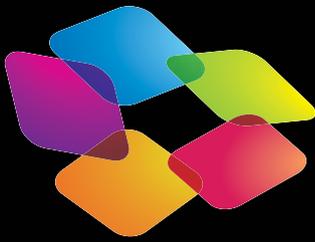
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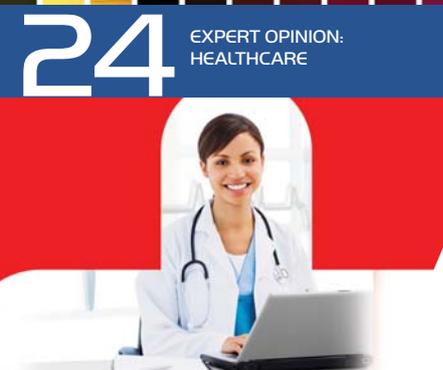
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Stuart Cochran, CTO of Evolving Systems, sees M2M as one more reason for communications network operators to reinvent themselves



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To paraphrase Bill Clinton, as Barbara Lancaster does here, "It's not about the machines, dummy, it's about the networks!"

EVOLVING SYSTEMS

Cover Photo: **Stuart Cochran**, CTO of Evolving Systems

Evolving Systems' dynamic provisioning solutions are a new way of providing service to any mobile or connected device with a SIM card. They provide sales, marketing, supply chain and network cost benefits by only provisioning devices when they are used. For mobile broadband devices, dynamic provisioning creates a simpler, more compelling user experience. For machine-to-machine applications, dynamic provisioning reduces cost overheads and lets service providers better manage and control M2M devices. Founded in 1985, Evolving Systems is a trusted partner to over 75 network operators, and offers expert knowledge and unmatched experience. www.evolving.com



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M2M: A rare wave of opportunity

Every now and then an industry pauses, gathers itself like a new wave and surges forward with greater power than ever before. Technological advances and evolving business models seem to mean that it happens more often in the communications 'industry' than almost anywhere. And if you're quick enough to catch the wave it can be a risky but exhilarating ride. So it is with M2M.

Of course, sometimes it's hard to analyse what's creating the swell until it's happened, by which time everyone can see it for themselves. So, at **M2M Now** (with the same team that brought you **VanillaPlus**, the fastest growing magazine in telecoms for the last five years) we won't be relying solely on our own senses; we are proud to announce that we have already signed up our first Editorial Advisers (see panel, left) whose vast personal networks rival those of most machines.

We're interviewing people who have built profitable businesses in machine-to-machine communications for all manner of industries (see **Vodafone** Case Study, pages 29-30). But long experience of the communications sector has also taught us the need to exchange information online, through our new web portal, www.m2mnow.biz, as well as face-to-face and in print. And you can follow our progress on twitter: @jcm2m

There are multiple factors at play in M2M's expansion. The growing number of network operators with dedicated M2M business divisions, the rapid decline in operators' voice revenues, a growing range of sensors, ever-improving connectivity, the proliferation of connected consumer devices – ranging from in-car infotainment to cameras, and from washing machines to TVs and picture frames. Together they are leading industry analysts worldwide to forecast an extraordinary future for embedded devices (see News, page 5). All in all, it's time for **M2M Now**. ☞

Jeremy Cowan
Editor, M2M Now
twitter: @jcm2m





Machines account for 2.0% of mobile network connections worldwide, says Berg Insight



Tobias Ryberg, Berg Insight

A new research report from Gothenburg, Sweden-based analyst firm Berg Insight, says that 2.0% of mobile network connections worldwide were used for wireless machine-to-machine communication at the

end of 2010. The number of M2M subscribers increased by 46% year-on-year to an estimated 81.4 million. In the next five years, the total number of wireless M2M connections is forecast to grow at a compound annual growth rate of 32% reaching 294.1 million connections in 2015. By then M2M is projected to reach 4.0% of all cellular connections.

“M2M and connected devices is now one of the main drivers behind the growth in mobile subscribers in Europe and North America,” said Tobias Ryberg, Senior Analyst, Berg Insight. “All of the world’s largest telecom operators now have several million M2M subscribers in their mobile networks. In Q1-2011, we expect that AT&T will become the first mobile operators to reach 10 million M2M subscribers after more than doubling the installed base in the past 12 months, largely thanks to a successful strategy for connected consumer electronics devices.”

Mobile operators are facing a new market landscape where customers no longer have one or two mobile

subscriptions. Besides his or her smartphone and tablet, a technology-savvy American is likely to own an e-reader and a connected PND, drive a car with an embedded telematics system and have a cellular security alarm installed at home.

Their Scandinavian counterparts could have a smart electricity meter with embedded GPRS connectivity; a Frenchman may use a cellular speed control warning system and an Italian might have installed a car telematics device from his insurance company. Tobias Ryberg predicts that the vast majority of the world’s next five billion mobile connections will be embedded into consumer devices, machines and sensors.

3G central to operators’ embedded mobile strategy

The GSMA has unveiled research that shows 3G embedded modules have a lower total cost of ownership (TCO) than modules based on 2G technology. The report by Analysys Mason may prompt operators to deploy 3G embedded technology to reap the benefits of mobile broadband, such as higher data throughput, enhanced capacity and richer mobile services.

Commissioned by the GSMA, the report follows 23 in-depth interviews with key players in the embedded mobile industry such as AT&T, Deutsche Telekom, Qualcomm, Telenor Connexion and

Vodafone. It reveals that 3G delivers lower on-going network costs than 2G, while also offsetting potentially high 2G replacement costs.

Glenn Lurie, President, Emerging Devices, Resale and Partnerships, AT&T, said: “Module costs are just one part of the equation when bringing the next range of connected devices and services to market. Other factors, including unique requirements by vertical segments, certification process, provisioning, and support also share in the costs for a complete embedded solution. The good news is that as 3G

multi-mode modules reach economies of scale, they are closing the cost gap with 2G modules and will help further reduce the total cost of ownership.”

While roughly 90% of wireless modules deployed today use 2G technology, this research shows the benefits of replacing 2G with 3G modules. These include the ability to maximise flexibility when it comes to longer-term network strategy; minimise the costs associated with replacing legacy 2G embedded devices; and ensuring they are better equipped to meet future embedded mobile demand.

NEWS IN BRIEF | NEWS IN BRIEF

Jasper Wireless platform connects Telefónica to M2M and consumer electronics devices

Jasper Wireless and Telefónica, Spain’s incumbent communications network operator, have partnered to wirelessly connect M2M and consumer electronics devices. The Telefónica Control Center, powered by Jasper Wireless of Sunnyvale, USA, enables M2M enterprise customers and device manufacturers to profitably connect and manage embedded mobile devices, advancing their design and market introduction. Terms of the deal were not disclosed.

The Telefónica and Jasper Wireless collaboration will accelerate market entry

for a new generation of connected consumer devices, including personal navigation devices, e-readers, digital photo frames, cameras, and gaming. Additionally, it will bring automation and advanced control features to enterprise applications in sectors such as automotive, smart grid, tracking, security and mobile healthcare.

“Connected devices are the future of consumer and industrial electronics. With Jasper Wireless’s support, Telefónica is ready to offer tailored services to its enterprise customers, including flexible business models, real-time monitoring and diagnostics, and enhanced customer support. The Jasper Wireless platform enables Telefónica to offer our existing customers a complete solution for designing

and managing connected devices,” says Carlos Morales, Global M2M Director, Telefónica.

“Mobile operators worldwide are looking to capitalise on the demand for connected consumer and enterprise devices. Combining its network and Jasper’s platform, Telefónica is able to simplify connectivity and management processes, enabling a rapid introduction of embedded mobile devices to the market,” says Jahangir Mohammed, CEO of Jasper Wireless.



HARMAN and Sierra Wireless collaborate to bring 4G/LTE mobile broadband connectivity to the car ...

HARMAN, a leading global audio and infotainment group (NYSE:HAR), and Sierra Wireless, a specialist in high-speed mobile computing and wireless M2M communication (NASDAQ:SWIR – TSX:SW), have jointly committed to bringing automotive customers the first 4G broadband connectivity.

HARMAN will support Sierra Wireless AirPrime™ intelligent embedded modules for LTE networks with the aim of offering robust in-vehicle wireless connectivity to enable high bandwidth

telematics, navigation, and online infotainment applications. The AirPrime modules also leverage broadly adopted applications programming interfaces (APIs) to encourage a growing ecosystem of software providers' solutions for connectivity, location, and manageability.

This will give users wireless data access at download speeds of up to 100 megabits per second (Mbps) and upload speeds up to 50 Mbps on LTE networks, making it possible to provide a true multi-faceted media, office and online

experience within the vehicle. Applications will range from driver enhancements such as real-time mapping and traffic updates, to online passenger services such as dynamic loaded applications and content, gaming, streaming video, and full internet access shared among multiple devices.

According to automotive researchers Strategy Analytics, 70% of vehicles produced globally in 2009 had some form of connectivity system and the number is expected to increase to 95% by 2012.

... and Sierra Wireless wins best wireless module award

Sierra Wireless's AirPrime™ SL6087 EDGE wireless module has won the GSMA's Embedded Mobile Module award in the "Best 2G Module" category. The judges recognised that it offered a "cost-effective and innovative EDGE solution in a compact LGA form factor", and praised its powerful application framework which enables M2M device developers to embed their app software onto the module itself.

"The AirPrime SL6087 2G module by Sierra Wireless demonstrates a strong overall package with rich functionality and very attractive pricing suitable for multi-application verticals," said the judging panel.

"We are proud to have won this

prestigious industry award for our AirPrime SL6087, which has been very well received by the market since we introduced it in March 2010," said Didier Dutronc, Senior Vice President and General Manager, M2M Embedded Solutions for Sierra Wireless. "We continue to invest significant R&D effort in developing new, innovative 2G, 3G and 4G connectivity solutions for the machine-to-machine communications market."

The winners of the GSMA's Embedded Mobile Module Competition were announced at the Mobile Asia Congress in Hong Kong. Representatives from mobile operators including Vodafone, Orange, AT&T, Telecom Italia, KT and Smart Communications, who formed the

judging panel, were looking for solutions with the best application functionality, innovation and the potential to drive economies of scale.

In a recent report on WWAN M2M modules, iSuppli listed Sierra Wireless as the leading module vendor with a 33% market share in the first half of 2010.



AirPrime SL6087 2G module "suitable for multi-application verticals", said the judges

NEWS IN BRIEF | NEWS IN BRIEF



Ian Marsden

GSMA initiative to look into embedded SIMs

As part of an initiative announced in November 2010, the GSMA has formed a task force of mobile operators to explore the development of an embedded SIM that can be remotely

activated, writes *Alun Lewis*.

The move is intended to enable the design of exciting new form factors for mobile

communications. It is also expected to speed the development of machine-to-machine (M2M) services by making it easier to bring mobile broadband to non-traditional devices such as cameras, MP3 players, navigation devices and e-readers, as well as smart meters.

"The GSMA's development will become a major catalyst in the explosion of connected devices, not only in 2011 but throughout the next few years," says Ian Marsden, CTO at M2M enabler Eseye. "As a key M2M enabler, Eseye have witnessed first-hand the challenges ahead of mass deployment for

embedded SIMs.

"Fragmentation in the market has been a key barrier to mass adoption and with the GSMA's support, this has now been addressed. Connected devices are already enabling solutions across multiple verticals as varied as consumer electronics to e-health and security applications, and this is now set to expand drastically," adds Marsden.



M2M Evolution – the event that is everything M2M

February 2-4, 2011

Miami Beach Convention Center, Miami, Florida, USA

<http://m2m.tmcnet.com//conference/east-11>

Mobile World Congress 2011

February 14-17, 2011

Fira Convention Centre, Barcelona, Spain

www.mobileworldcongress.com

Miami Beach, Florida plays host to M2M Evolution

Connected Home Global Summit

May 24-26, 2011

London, UK

www.avrevents.com/home.asp?

Event=ConnectedHomeEU2011

Next Generation Mobile Devices

May 26, 2011

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PRODUCT NEWS

Digi and Sprint claim first commercial-grade integrated 4G routers for M2M services

Minnesota-based Digi International (NASDAQ: DGII) has introduced what it says are the industry's first commercial-grade integrated 4G routers - the Digi Connect WAN 4G and ConnectPort X4 4G. Certified by network operators Sprint (NYSE: S) and Clearwire, the routers provide high-speed, low latency connectivity via 4G networks to remote sites, devices and device/sensor networks.

Sprint is the first US national wireless carrier to launch a 4G network, and its fast speeds make the routers ideal for high-bandwidth, machine-to-machine (M2M) services such as digital signage, video surveillance and mobile computing. The low latency of 4G enables mission-critical applications where real-time device connectivity is essential, such as in

remote industrial networks.

"4G dramatically increases the bandwidth and lowers the latency of wireless WAN connections," said Larry Kraft, Digi International's Senior Vice President of Global Sales and Marketing. "Over five years ago, Digi launched the first commercial-grade cellular routers with our Digi Connect WAN. We're now bringing years of expertise with vertically-focused M2M applications into this exciting 4G partnership with Sprint."

Wayne Ward, Vice President of Emerging Solutions at Sprint, added, "4G is opening up new consumer and commercial applications that are transforming the way people use and benefit from mobility. Connectivity of M2M devices is rapidly growing,

and Digi is the leading enabler of M2M applications with specific vertical market experience."

These 4G routers are said to be ideal for transportation, fleet management, outdoor street lighting, traffic control signal, security, energy management and other applications that require high bandwidth and low latency connectivity. The Digi Connect WAN 4G features flexible device interfaces including RS-232 serial, USB and Ethernet for device connectivity. The ConnectPort X4 4G also features ZigBee to WiMAX allowing it to connect to a network of ZigBee-enabled wireless devices or sensors. A version with a NEMA X4/IP66 enclosure is also available for harsh environments.



Larry Kraft,
Digi
International:
4G
dramatically
increases
bandwidth and
lowers latency



Wayne Ward,
Sprint: 4G is
transforming
the way people
use mobility



SIM PROVISIONING:

M2M - One more reason for network operators to re-invent themselves

Stuart Cochran joined Evolving Systems in 2004 when the company acquired Tertio Telecoms Ltd. From 2005 he was VP, Activation & Mediation Market Unit, before being promoted in 2007 to become Chief Technology Officer. In M2M Now's first Talking Heads interview, he tells the Editor, Jeremy Cowan how communications network operators must re-invent themselves if they are to take advantage of the opportunities presented by connected devices.

"It's wasteful, inefficient, expensive and causes all sorts of problems to the downstream value chain."
- Stuart Cochran, Evolving Systems

M2M Now: There have been forecasts recently of enormous growth in the use of connected devices. Which forecasts do you work with and what are the implications for network operators?

Stuart Cochran: Yes, there've been forecasts of billions and even trillions of connected devices. Some data is looking at the machine-to-machine (M2M) base and blurring the definition. If you look at the industrial M2M market like telematics and telemetry, automotive applications and smart metering, there are two forecasts we've been using.

Berg Insight are looking at about 190 million end-to-end connections by 2014. The other forecast comes from **ABI Research**, saying about 225 million connections by 2014. Let's say it's 200 million connections in three to four years time. The large forecast of 50 billion connected devices they also came out with was by 2020. I think the connected devices market is much broader than how people look at M2M today, and it's a great opportunity for operators.

M2M Now: What is your definition of M2M then?

Cochran: We look at not just the industrial machine-to-machine market, but also at the market for connected consumer electronics devices. But, in terms of

how our solution helps operators and MVNOs, then the challenge we see is that the M2M market (and even the connected device market) is very fragmented. We don't think our solution will work in every single market, although it works in many and provides real value.

The big issue is that the operators have to find a way to reinvent themselves, and a way to provide connectivity services to other providers and their customers, to deal with this fragmented, diverse market opportunity. It's quite different from what they've been doing for the last 10 or 15 years which is retailing handsets from their own stores.

M2M Now: Clearly, it isn't just the volume of devices that's the issue, it's the nature of their communications. Can you give some idea of the scale and range of communications types you're talking about?

Cochran: When we think about the impact of machine-to-machine on the operator it impacts in four areas – the commercial model and pricing approach that they take for these new customers; whether they're enterprises, consumer electronics manufacturers, they're smart metering companies, or whatever.

The second area is production and testing; say an operator wanted a cellular module to put into a connected photo frame. They may only be manufactured and tested in China, they may then be shipped and stay in warehousing for a long time before they're distributed to retail, and then they're sold in the high street store.

The third area is distribution and provisioning; how do you provide service to these devices?

And the fourth area is connectivity, support and diagnostics. Our solutions really focus on the last two, provisioning and distribution, and connectivity. You're right, the connectivity model of a mobile phone or other communication device which I turn on in the morning, leave on and use throughout the day to send texts, browse the internet, and make calls, is obviously very different from many applications. →





Take smart metering; we've been talking to a company that's looking at an application for gas line monitoring, putting a regulator module onto pipelines for storage tanks, and they record the storage levels once a week. Or you may have some devices that only report on an exception basis, they don't have a regular schedule of reporting, they only report if a sensor is tripped.

The idea that these devices which work on wireless networks are permanently switched on, permanently connected, moving around and mobile is not true for many M2M applications. You may have devices that are only transmitting information occasionally, they call them intermittent transmitters. They send small amounts of data, a little data packet containing a meter reading.

That's one of the key areas that industry needs to deal with; how do they cost-effectively support these devices that don't need to be permanently connected to the network? It's wasteful, inefficient, expensive and causes all sorts of problems to the downstream value chain, too.

M2M Now: That's the challenge that service providers need to be aware of, but are they?

Cochran: They are becoming aware. There are two obstacles at the moment; the market is still quite small, it's obviously of great interest but even 200 million connections in three or four years' time is still a tiny drop compared to the billions of connections for traditional wireless voice and data services. Some of these issues can be ignored for a time because the volumes aren't quite large enough, though that's starting to end.

The second reason is that the operator understands the market is diverse, fragmented. There are these intermittent transmitters, but other applications that are machine-to-machine need to have permanent, full streaming, two-way connection every hour of the day.

There are lots of different approaches that operators have to support. But what they're not saying is 'In order to support this new market opportunity we've got to reinvent ourselves, we've got to rethink what we're doing'. They're trying to make do with the way the network has worked up to now, the way services have been provisioned until now. They're not saying this can be done in a more cost-effective way.

M2M Now: Which companies have already demonstrated strong performance in this area?

Cochran: Operators have been creating dedicated machine-to-machine business units. **Vodafone** have done that, and **Orange** has done the same. **Verizon** have a joint venture with **Qualcomm** called nPhase, and in the US **AT&T** have created a machine-to-machine unit, as have **KPN** and **Telenor**.

In Europe the operating groups are trying to create a single point of contact. They're saying, if you're a consumer electronics manufacturer, in Europe, rather than having to deal with each operator in each country in which you want to do business, just deal with us and we will provide you with a pan-European or pan-national service.

The second thing they're trying to do – and this is also true of operators in the US – is create dedicated customer teams; sales and marketing, business development, and customer support for these new kinds of customer. And they're creating management portals and platforms which service providers and customers can use to manage their devices.

Of course, the revenue potential from some of these applications is far, far smaller than what operators have been used to. The revenue is often in the low single digit dollars or euros per month, ranging from two to six, compared to the 50, 60, 70 dollars or euros that operators have got used to. So, how do they create profits in that environment?

One way is through huge volumes, huge scale – if you can support billions of devices then you can make good money. But we're not there yet and the forecast won't get us there for years.

So, what the operators are doing is finding ways to strip out as much cost as possible. They have to take out operating cost and make the support of these applications, the devices, as cost-effective as possible.

M2M Now: You've talked about stripping out cost, how can Evolving Systems assist in this?

Cochran: If you think about these 'intermittent transmitters', they only send small packets of data every now and then. If they are provisioned as normal, if the network supports them just as it would a normal device, which means it's permanently connected, there are quite a few areas of wastage.

First, you might be giving an MSISDN to every device. You don't need to do that for a device that only wakes up on one day a month and sends you information for 15 seconds, it's a complete waste. Also, things like the home location register; if you provision a device as normal you have to create entries in these databases, and operators have to pay their network equipment providers for every entry in those databases.

Again, if you've got tens of millions of M2M devices that only need to be connected to the network for a few minutes every day, if you're paying for every one of those devices as if it is a normal subscription, then that increases your operating cost.

Obviously, resource is in the network. If you look at smartphones, there's been a lot of talk about the growth in mobile data but many of the problems have been caused by the growth in signalling traffic, (such as) congestion and poor quality of service, because smartphones have been aggressive in signalling to the network. →

"We completely avoid having to treat this device as if it's a normal phone."

- Stuart Cochran, Evolving Systems

M2M communication networks are being used for gas pipeline monitoring





“Best practice comes when you see an operator organising itself differently, working with new kinds of partner, rather than thinking they can do it all themselves.”
- Stuart Cochran,
Evolving Systems

And finally, we hear a lot about the need to optimise the device. We talk a lot about the impact on the operator, their network and cost structure, but also there's an impact on the overall eco-system and the business model for M2M devices. If you're selling a phone for \$400 and the customer is going to pay \$40 a month for the contract, then you can make really good money if the build cost for that phone is \$200.

But if you're trying to put modules into photo frames, home energy monitors, meters, gas pipelines, and all sorts of other things which only retail for a few tens of dollars, then you need to make those modules as low cost as possible. Part of the module cost is how sophisticated it needs to be, but also how much energy it uses, and so on.

One way to minimise the cost of the device and increase efficiency is to have a network that supports these devices more effectively by reducing the sophistication and processing on the device. By doing the processing on the network instead you can make the device cheaper. By making it cheaper the operator can open up new market opportunities.

These devices consume resources, numbers, power, and database space in the network. So we've created an intelligent gateway, that sits between the devices and the operator's management portal or platform, and allows the platform or portal to communicate with and manage the device, without the device being permanently provisioned into the operator's network.

We avoid having to treat this device as if it's a normal phone, because it's not a normal phone, it's a different kind of device that only needs to connect to the network occasionally and it's massively wasteful to give it a number permanently, give it a slot in an HLR permanently, when it can be managed using our gateway and still be integrated into the network in the normal way.

It's not a proprietary device, it's a normal device with a normal SIM card in it and a normal module in it, but our intelligent gateway is able to help the operator strip out the cost and manage these devices far more effectively.

M2M Now: What have you called your intelligent gateway?

Cochran: It is a version of our Dynamic SIM Allocation (DSA) product. DSA is used by operators to minimise the provisioning cost and provide logistics, supply chain and user experience benefits for any kind of device that has a SIM card.

These connected devices that have wireless connections also have SIM cards in them – they could be soldered onto the circuit board but they still have a SIM card and connect in the same way. So, our DSA for machine-to-machine acts as its gateway between the portal and the device to provide this intelligent management, avoiding waste.

M2M Now: What operator examples are there of best practice?

Cochran: I mentioned some of the service providers that have launched dedicated business units. What's

interesting is we're seeing not just the operator creating these business units and trying to introduce those packages, but also we're seeing MVNOs who are specialising.

In many cases operators have a go-to-market strategy that it's not them doing it all themselves, but relying on MVNOs and other kinds of service provider. It requires different skills that the operators haven't been used to.

We were talking with a company that was going to network operators in North America and saying, "I've got a concept for a connected device, I have a business plan for it, can you give me your best price? How much do I need to pay you per month for this device to be wireless enabled?" And the operators were quoting \$1 to \$2 per device, per month.

But this person was saying, 'My business plan says I have to be only paying about 50 cents per month'. Unless they can get to that price point with these new devices, there's a new industry that can't be created.

There's a company called **Jasper Wireless** which acts as an MVNO in some territories, but in other countries is really partnering with the network operator. The operator is saying we can't do this all ourselves. For now we need to rely upon these service providers who are MVNOs to help us reach these markets, do this integration, and provide the management portal.

M2M Now: Where is the M2M market most advanced?

Cochran: North America and Europe are leading the market. If you look at the forecast data, where by 2014 there'll be about 200 million M2M connections, that will still be less than 3% of total (global) connections.

It's still small, but if you look at some countries, in Scandinavia in particular, but also North America, they've been more aggressive in supporting different devices and business models.

One of the drivers behind which regions are going to see most growth is the regulatory and government action. For example, the EU has an initiative called eCall which is looking at emergency calls from cars which are involved in accidents. Governments are also looking at investing in infrastructure projects like road building, smart metering, and smart grid.

It's in the developed markets where we see the most volume at the moment. The bigger potential comes when you look at consumer electronics connected to consumer electronics and that market, electrical, is global.

M2M Now: How far away are we from that watershed?

Cochran: We're starting to see it. When **Amazon** launched Kindle in Europe they were faced with this challenge of, 'How do I wireless-enable something if I'm going to sell it in many countries and each country has different operators with different ways of doing things?'. →

M2M Jargon Buster

MSISDN = Mobile Subscriber ISDN Number

MVNO = Mobile Virtual Network Operator



What Amazon did, at least initially, was say we can't have a single way to work with all operators throughout Europe. So we'll rely on AT&T for the US, and all those Kindles sold in Europe were given AT&T SIM cards as subscriptions and were just roaming into European networks.

Operators have to be able to appeal to consumer electronics manufacturers or retailers, in this case Amazon, to make it easy for the manufacturer to get pan-European global solutions in place. Because the manufacturer doesn't think, "I build my laptop, my tablet, my photo frame, and I build one for France and one for Germany and one for the UK and one for Belgium". They build it for Europe or for the West and want to ship it into any country.

I guess the other example is the rumour about **Apple** embedding SIM cards into the iPhone and allowing the user to select the carrier from iTunes. It's not about machine-to-machine, but it's another breakdown in the way devices are currently provisioned and connectivity is divided. So, things are changing, but where there's a tipping point is hard to say.

M2M Now: That touches on my last question which is, 'What skill sets do operators lack that will be needed in M2M communications?'

Cochran: Operators need to be able to market the existing development and sales into fragmented, diverse industries. And they need systems integration because every manufacturer, every industry might have a slightly different requirement. Of course, they need different billing and pricing models as well.

So the Kindle 'comes-with-data' model – where you don't pay for access or gigabytes of data, you just pay for content, you pay for your device – is a challenge that operators are going to have to deal with.

M2M Now: It just seems to be one more way in which operators need to reinvent themselves.

Cochran: That's right. And the other part of the challenge is can they do it quickly enough? That's why they're working with MVNOs as their providers; the business units within the operators recognise that they're big companies and some of them are slow to change.

That's a positive side; operators are saying we don't have to do this all ourselves, we can work in a more extended eco-system, and supply chain. 

www.evolvi.com

"The (Kindle-style) 'comes-with-data' model – you just pay for your device – is a challenge operators are going to have to deal with."

- **Stuart Cochran,**
Evolving Systems



The author, Alun Lewis, is a freelance telecoms writer

'There's plenty of room at the bottom' Strategies for success in an M2M world

Richard Feynman, Nobel-Prize-winning physicist and all-round genius, gave a seminal paper back in 1959, *There's Plenty of Room at the Bottom*, which is now widely seen as heralding the birth of nanotechnology. Many of the concepts that he explored today seem strangely relevant to the next stages of growth for the communications sector where new technologies – and a curiously human drive to connect everything to everything – are already opening up new markets to well-established players as well as a host of new entrants. →



“China is targeting (the Internet of Things) as a major growth area for the country’s industries.”

- Peter Zimmerman, Nokia Siemens Networks

What exactly you call this new market will probably depend on your business focus. For some, it’s machine-to-machine – or M2M. For others, it’s all about embedded devices – or connected devices.

However, just as has happened with so many other emerging telecoms and IT sectors over the years, it’s going to be important not to limit a wider vision too early on by becoming caught up in semantics as Jeff Edlund, Chief Technologist at HP’s CME division explains. “There is a big vocabulary problem here. There’s nothing especially new about M2M – and the industry has been doing it for years – but these have usually been in very narrow and siloed applications areas. You still run across people who only interpret things in terms of the technologies in use – such as NFC versus RFID versus Contactless Payment – for example.

“What’s catalysing the change is the availability of ubiquitous connectivity – and a new generation of sensors,” says Edlund. “That’s why there’s work underway at HP Labs on our Central Nervous System for the Earth, or CeNSE concept. The research and development programme aims to build a planet-wide sensing network using billions of tiny, cheap, tough and highly sensitive detectors.”

Consumer focus?

Complementing this all-encompassing vision are other concepts, like Ericsson CEO, Hans Vestberg’s recent prediction of 50 billion internet-connected devices by 2010. Andreas Hessler, Director of Ericsson’s 50 Billion Devices programme comments, “While M2M applications have been around for a while, a lot of our strategic direction is oriented to supporting consumer electronics – though boundaries naturally blur when you have devices that can essentially ‘look out’ from the internet through web cams and sensors, as well as ‘look in’ to access applications, information and content.”

Hessler continues, “Ultimately – and especially given the appearance of IPv6 and its ability to eliminate IP address exhaustion – everything will be addressable. The challenge for the communications sector will be to turn this connectivity into both a service and a business. For this reason, it’s vitally important that we don’t become too focused on developing extensive proprietary solutions.

“Many vertical market industry sectors already have their own protocols, engineering environments and specific market needs and it would be wrong to try and replicate these. There are some especial challenges for CSPs and the wider community: what’s the business model when a basic connectivity service might only bring in a few Euros a year – and how do you cope with provisioning and support with hundreds of thousands of consumer devices being activated almost simultaneously?” asks Ericsson’s Hessler.

Service perspective

This focus on understanding M2M from a service perspective is also echoed by Peter Zimmerman, Head of Smart Objects/M2M at Nokia Siemens Networks. “While we’ve had concepts like ‘The Internet of Things’ for a while now, the reality is that it’s a very fragmented environment with a certain lack of clarity about the direction the emerging value chain could take. That said, however, a lot of co-ordination work is underway. China, for example, is targeting this as a major growth area for the country’s industries, while in Europe there is the Future Internet Assembly coordinating a range of activities.

“Essentially, we need a new term here: ‘Smart Services’ to connect Smart Devices,” Zimmerman adds. “And there’s a key role for CSPs here in running premium services able to handle mobility and data quality and integrity. In many cases, the data load won’t be heavy at all but managing hundreds of thousands – or even millions of devices presents its own particular challenges.”

One of the organisations already playing a major co-ordinating role, as you might expect, is the GSMA with its Embedded Mobile programme, partnering across different verticals to try and develop best practice for the integration of mobile connectivity into different devices.

Ana Tavares, Senior Director, Strategy and Technology at the GSMA highlights current strategy says: “Terms can certainly be confusing in this area, which is why we decided to call our work ‘Embedded Mobile’ and we’re working with a wide number of different vertical markets and specialist vendors in areas like health, automotive and the →



Peter Zimmermann, NSN: The reality is a very fragmented environment



Jeff Edlund, HP: Big vocabulary problem in the industry



Nigel Chadwick, Stream Communications: Exploiting CSPs’ strength in network coverage

“Many large CSPs (are) keen to enter this market.”

- Nigel Chadwick, Stream Communications



Ana Tavares, GSMA: Solutions on show at MWC in an 'Embedded Mobile House'

utilities to see how we can all best work together. A number of these solutions will be on show at MWC this year in an 'Embedded Mobile House' in the courtyard there. We'll also be releasing the second edition of our Guidelines for this area. Some of the topics we address in these include provisioning, test and certification, regulation, and policy and roaming, security and fraud."

Multiple industries

While co-ordination work continues in a variety of ways across multiple sectors, a number of hardware vendors and specialist service providers are already finding ways of successfully building businesses. Nigel Chadwick, Managing Director at **Stream Communications**, a specialist M2M MVNO, sees many large CSPs as keen to enter this market and exploit their strengths in network coverage, but simultaneously aware that it's not currently worth building a business themselves.



Mark Lucas, Eseye: M2M is an enabling technology, not an app

"We're essentially about giving mobile service providers a ready-to-go platform that they can re-badge to quickly get into areas like CCTV and security, digital signage running dynamic content and remote telemetry monitoring," says Chadwick. "It's a low margin business and we're able to use our specialist knowledge in things like ruggedised SIMs, interconnects to OSS/BSSs and network reliability to get to market very quickly."



Peter Thompson, GoS Networks: Exponential data growth

A complementary perspective also comes from Mark Lucas, Sales Director at **Eseye**, a company focused on bringing M2M connectivity to device manufacturers. He says that M2M is an enabling technology – not an application in its own right. "In many contexts, M2M is about enabling and extending service delivery for product manufacturers, as many applications are basically extensions of products. If you're a car manufacturer and one of your new vehicle options involves offering some sort of remote telemetry service then you need support for that – at a fixed cost – anywhere that that vehicle is shipped.



Andreas Hessler, Ericsson: Don't become too focused on extensive proprietary solutions

"Say you're a medical fridge manufacturer and each of your products might hold tens of thousands of dollars worth of temperature-sensitive vaccines. You need an end-to-end solution that can be retro-fitted to existing products, connect in a

variety of different ways – and send data back to an easily managed portal that can track and record temperatures for audit purposes – or send out automatic alerts. A service necessarily involves far more than just connectivity," according to Lucas.

Opportunity for CSPs

The potential this holds for the future of CSPs is emphasised by Kevin Meagher, CEO of device management specialists, **Intamac**. "This is where CSPs have competitive advantage and opportunity. They have the infrastructure to manage the network and deal with customer service. Manufacturers want to embrace these new technologies – but they need the infrastructure in place to roll out a new generation of intelligent devices. Finally," adds Meagher, "consumers won't want to go to multiple websites to monitor and control individual devices – they want someone to pull them together on a single GUI. Leveraging broadband and exploiting the web by using cloud-based platforms is the key to success."

Certain caveats do, however, need to be taken into account, as Peter Thompson, Chief Scientist at QoS/QoE specialists **GoS Networks** explains: "If the market really does accelerate to meet predictions there'll also be exponential growth in the volume of data transiting the network. Some will be low-priority and not time-sensitive, but a significant proportion will be real-time and mission-critical and it will be essential to be able to manage this. CSPs deploying M2M solutions need to consider how they will cope with this demand from the outset."

A final caveat also comes from a well-known industry anecdote. Back in 1995 a woman in Massachusetts kept being pestered – every 90 minutes – by silent calls. After months of this and an estimated 2,688 calls, police and the phone company finally tracked down the culprit. It was an empty oil storage tank in a basement, plaintively trying to tell its old supplier – long gone out of business – that it was now empty. The autodial number had been reassigned to the woman's home.

This is a clear case of a real 'Ghost in the Machine' – and one to keep in mind as we give machines more connectivity and intelligence ... 

M2M Jargon Buster

- CSP** = Communications Service Provider
- GUI** = Graphical User Interface
- NFC** = Near Field Communications
- OSS/BSS** = Operations / Business Support System
- RFID** = Radio Frequency Identification (Device)





M2M predictions for 2011

We ask Philippe Guillemette, CTO of Sierra Wireless, to look into his crystal ball and tell us about the year ahead in M2M.

M2M Now: What are Sierra Wireless' predictions for the M2M industry in 2011?

Philippe Guillemette: I think it will be a year of recovery for many industries, including M2M. It will also be a year where M2M attracts greater attention from carriers with dedicated organisations, teams, and billing plans for M2M offerings. There's a tremendous opportunity for carriers to offer tiered pricing around these services and increase their revenues. M2M applications allow carriers to charge based on the type of data, rather than the amount of data.

M2M Now: Which vertical markets will generate the most growth in the M2M industry?

PG: One of the most important areas for development in 2011 will be end-to-end energy management. The western world has been consuming energy without any control for the last 50 years. The brutal reality is more than two billion people want to join the party.

Countries won't solve a problem of this magnitude by building more power plants, or simply monitoring energy usage. The solution is controlling business and consumer energy demand. Sierra Wireless is ahead of the curve in this market, providing the M2M building blocks that make it easy to develop and deploy an end-to-end wireless energy management solution for industrial and residential consumers, substations, and power generation applications – and automotive charging stations in the future.

The automotive industry will be another growth area for M2M, with a variety of applications, including emergency calling and diagnostics, navigation and infotainment, and stolen vehicle tracking and recovery. In future consumers may buy the car and rent the battery; and companies will develop apps to monitor batteries remotely, to optimise performance and reliability and also help their customers find and book charging stations.

M2M Now: How will the introduction of LTE networks affect M2M market growth?

PG: LTE will potentially have a big impact on M2M, growing over time. The compelling advantage for using LTE for M2M applications is that it not only provides high bandwidth when needed, but also minimises the network resources required to transmit

data. As a result, you can efficiently transmit a small amount of data to lots of devices, which is ideal for a large part of M2M traffic. Sierra Wireless is playing an active role in the standards committees for LTE, working together with other companies to create a specific class of low profile LTE devices. We have already launched our first LTE modules.

M2M Now: Analysts have been predicting that the M2M market would take off for some time now. What's different today compared to 10 years ago?

PG: The M2M industry is now where multimedia-rich applications were 10 years ago, when the internet was not fast enough and Windows was not multimedia-rich enough. Consequently, development time and cost were outside the reach of most companies.

Our OEM customers work with Sierra Wireless because our pre-packaged solutions allow them to focus on their applications, rather than on the implementation details of the building blocks, so that it's easier, faster, and more cost-effective to bring their solutions to market. In addition, today we have ubiquitous and reliable nationwide cellular networks. This network infrastructure is an important enabler for delivering an end-to-end M2M solution.

M2M Now: Are we going to see a boom in the consumer device category through the introduction of tablets in 2011?

PG: The whole industry seems to be building tablets, but the question is what applications will drive usage? I can envision the tablet providing a window or link to the different end-to-end devices that the consumer has, including security and energy management systems in the home and car.

I also think we'll see a fascinating connection between M2M usage and social networking; so that, for example, people can use their Facebook wall to share and compare how much energy they're saving. 



Philippe Guillemette, Sierra Wireless: Over 2bn people want to join the (energy consumption) party

EXPERT OPINION



The 'Inside Out' Play

It was 1995 and in a garage in Seattle, three guys were about to launch their website and start taking orders for books. They ran the site on three Sun servers and they rigged up one of the servers to play a bell sound every time an order was placed. Within a few weeks the sound of the bell was constant and they turned it off. Amazon.com was on its way to success.



The author, Fergus O'Reilly, is Chief Solution Expert for SAP Consume to Cash

Five years later, writes **SAP's** Fergus O'Reilly, at the beginning of the 2000s **Amazon** had close to 20 million customers and that garage with those three initial servers had grown to over 5 million square feet in fulfilment and datacentres worldwide with many thousands of servers.

Amazon could have just been happy to continue growing their e-commerce business at that point. But instead they saw the opportunity to invent an entirely new business, based on their existing infrastructure. Thus began Amazon Web Services (AWS).

Extending Amazon's platform

AWS began by opening up the Amazon.com e-commerce platform with open programmatic access, open APIs. Third-party developers could now build software to tap into the Amazon product catalogue, check availability, access customer-created content like ratings and reviews, use the search engine, the shopping cart and the famous Amazon 1-Click purchasing system.

This allowed other companies to build their own extensions to the Amazon platform, building their own selling sites powered by AWS under the hood. As Amazon said, "they surprise us by building features we never thought of."

Within a few years, over 100,000 developers had signed up with Amazon to use the AWS platform in their own e-commerce applications.

Amazon then saw another opportunity. By this time they had 50 million customer accounts and deep expertise in managing massively scalable, services-oriented IT infrastructure in their data and fulfilment centres. This core competence was focused on serving their internal needs. And there was a relentless focus on datacentre efficiency so that operational savings could be passed on to customers in the form of lower prices to gain competitive advantage.

... And into the cloud

Amazon then realised that other companies could also benefit from what they had developed. They launched compute and storage capacity in the cloud offerings as part of AWS.

This allowed developers to run their applications and store their data in the Amazon cloud. Developers could just concentrate on building applications without having to do the grunt work of building and managing scalable datacentres. Amazon monetised this with a pay-as-you-go, usage-based revenue model.

In doing this Amazon had essentially turned their systems inside out. Rather than just using their world class infrastructure for their own needs, they found a way to open it up so that others could consume and use it also.

They rapidly grew this part of their business, and over half a million developers now use AWS services. The compute capacity available in the Amazon cloud is now estimated to run on well over 40,000 servers, probably an order of magnitude larger than that which Amazon uses just for running its own commerce business.

Amazon does not report annual revenues from their cloud business but they are estimated by analysts to be over US\$500 million today, and growing quickly to reach \$1 billion within the next year or so.

A roadmap for M2M

This Amazon cloud success story should serve as an inspiration and even a roadmap to success for many companies entering the machine to machine space. In particular, telecom operators are waking up to the fact that they too need to turn their businesses inside out in order to address the opportunity in M2M.

Operators, like Amazon, know how to run →

"This Amazon cloud success story should be an inspiration and even a roadmap for companies entering the M2M space."
- Fergus O'Reilly, SAP



massively scalable datacentres: large telcos companies run some of the biggest datacentres in the world. Operators are also experts in providing network connectivity to tens or hundreds of millions of disparate end-point devices: the phones, tablets, TVs and consumer electronics that we all have in our homes, workplaces and pockets.

Operators know how to mass provision services to those devices. They also know how to diagnose and fix faults across their services and networks, and how to remotely manage and update the end-point devices connected to their network.

Finally, operators know how to track the location, status and usage patterns on those devices, reliably bringing that information all together in their billing systems to aggregate billions of micro-transactions to generate revenue.

Today these core competencies are all turned inward: telcos think about how they can efficiently run their datacentre, their network, and their services to provision, track and manage devices that they sell, to collect revenues that their customers pay them directly.

Can telcos turn inside out?

But M2M businesses also need to deploy and manage large numbers of smart devices across a wide geographic area, connect those devices back to applications in a datacentre, run services distributed across the network, track usage patterns, bill customers based on device and network utilisation, share revenue with partners and constantly analyse customer needs to keep ahead of the market.

It is evident that much of what any M2M business needs, telcos already do.

The inside out play for telcos means that they need to transform just like Amazon. Figure out how to take their internally-focused capabilities, and turn them into open platform services that developers at other companies can easily use to build their own M2M businesses.

This is not an easy transition. And running the combined businesses of many M2M customers on a single, shared platform means scaling that platform by one or two orders of magnitude from where it is today.

Succeeding in this business requires rethinking many of the core processes at the heart of a telco. Business processes must be designed to operate with minimal human touch points, since that is the only way to scale. M2M companies need to be able to come to a telco and start leveraging the telco platform infrastructure on demand, without having to go through long, tortuous sign-up processes or wait months for service to be turned on. Platform capabilities need to be easy to access, operate reliably and come with clear service-level agreements and transparent pricing schemes.

In many ways this inside out platform play should be a natural 'homerun' for telco operators. It can be a massive driver of revenue growth over the medium to long term. The business is theirs to lose. But if they do not move rapidly to capitalise on the potential then they will be bypassed.

Other players such as cloud computing providers like Amazon, **Google** and the major IT and SI companies could move rapidly into providing such turnkey M2M platforms. These players do not today have the same capabilities as telcos when it comes to such things as communications networks, remote management of smart devices and operation of efficient micro-transaction billing systems and high-volume analytics. But they could all take steps to acquire these for themselves.

The clock's running

If no one moves fast enough to become a complete and global M2M service provider then those looking to build new M2M businesses like companies in the manufacturing, utilities and high-tech industries will develop everything themselves: building their own datacentres, buying network capacity, figuring out how to mass provision and manage remote smart devices and how to analyse and monetise transactions across those hyper-connected devices to generate revenue and share it with partners.

Smart companies who build this will then inevitably realise that they can become M2M service providers themselves, using the platform they built not just to run their own business but selling its capabilities to others with similar needs.

Amazon showed the world how to successfully turn your core IT systems inside out, it is an approach just waiting to be emulated. \$

"It is evident that much of what any M2M business needs, telcos already do."
- Fergus O'Reilly, SAP



Cable & Wireless Worldwide

Will 2011 be the year that the smart grid flourishes?



Chris Huhne: "The value of the global low-carbon goods and environmental services market is expected to reach £4 trillion (by 2015). Growth like this is ... hard to ignore."

It is an exciting time to be involved in smart grid, says Amy Cooke, Strategic Business Development Director at Cable&Wireless Worldwide. At the time of writing, there are a number of positive stories on the subject: DECC's report on Energy Market Reform in December 2010 supported both smart meter and smart grid initiatives as key tenets of needed and continued market transformation; Ofgem (the UK energy regulator) has stated that smart grids are necessary to meet the British government's carbon reduction target of 20% by the year 2020, and the regulator recently awarded the first of several years of £64 million (€76 million) of funding to four projects designed to enhance the development of smart grids in the UK. Add to the mix that Pike Research estimates that the smart grid analytics market is expected to generate US\$4.2bn worldwide by 2015, rising from just \$356m in 2010, and this certainly sets the scene for 2011 to be the year that smart grid flourishes.

Smart grid is going to be a term we will hear a lot about this year and the business potential is enormous. According to *The Global Cleantech Report 2010*, energy efficiency has overtaken solar as the hottest sub-sector within cleantech. It will play a pivotal role in the low carbon economy, which is a burgeoning market.

As Chris Huhne, the UK Secretary of State for Energy & Climate Change, recently stated in his speech at The Cleantech summit: "The value of the global low-carbon goods and environmental services market is expected to reach £4 trillion by the end of this Parliament. It is growing at 4% per year, faster than world GDP. Our share of that →



market is £112 billion (€133 billion). In the UK, nearly a million people will be employed in the low-carbon sector by the end of the decade. In budgetary hard times, growth like this is hard to come by. And it is even harder to ignore.”

Out of date infrastructure

This all sounds very promising, but there are obviously barriers to the development of smart grid. The electricity infrastructure we use today was not designed for the mixture of low-carbon solutions that are emerging. Combined Heat and Power (CHP) and electric vehicles hadn't even been conceived when most of the infrastructure we use today was deployed, yet both have the potential to change the demands on and flows across the energy network.

There is a major need to shift the way electricity is generated and delivered. That same grid now must facilitate and integrate the intermittent nature of renewable energy, for example wind or solar energy, into the electricity infrastructure, and ensure that it matches the increasing consumer demand. In short, the grid needs to become a great deal smarter.

When I've spoken to people about the smart grid, at first they've been unsure as to the role the communications provider plays in this market. While the role may not at first be obvious, when you consider the amount of data that will be generated from the grid, it is clear – communication providers already have the infrastructure, or 'pipes' needed to transfer that data, and the communications network is key to enabling the various hardware used in the smart grid such as sensors, monitors and communication devices.

Information Communications Technology (ICT) can manage the significant increase in the complexity and volume of data about supply of and demand for power that the challenges of renewables, micro generation, granular usage metering, and two-way communications entail. The application of ICT can provide much more dynamic real-time information and greater interactivity between suppliers and consumers. Smart meters will provide consumers with granular information on electricity usage to help control consumption, save money and reduce emissions.

Roots in the utilities

Cable&Wireless Worldwide has its roots in the utilities sector and parentage from the UK's **National Grid**, **ScottishPower** and **United Utilities**, and this has given us visibility into what is

required to overcome many of the challenges involved in implementing a smart grid network. These include challenges such as interaction, maximising efficiency, second-by-second billing, real-time monitoring of systems, visibility of infrastructure down to every last node, and security.

Other potential barriers include the need for collaboration between the energy and telecommunications industries, and between the different parts of the energy industry itself. The smart grid will mean wide-reaching change and the need to build new and deeper relationships across disparate industries and unconnected parts of the sector.

We understand the importance of partnerships in order to make the smart grid a reality and we've been busy putting this into practice. For example, **Cable&Wireless Worldwide** and **CURRENT Group** are partnering to develop integrated smart grid and smart metering solutions to help utility companies achieve the goals of the UK Government's Low Carbon Economy and National Smart Metering programme.

In the case of the CURRENT partnership, our unique, secure next-generation network and ability to address complex communications requirements will be combined with their industry-leading smart grid sensors, smart meter data collectors and analytic software. The result will be an end-to-end, standards-based, interoperable smart grid solution that will improve the efficiency and reliability of the UK electric grid while reducing the environmental impact of electric usage.

Extra smart grid capabilities

The partnership takes advantage of the open and interoperable PRIME metering standard that uses existing electrical wires to communicate with smart meters via power line carrier communication technology. PRIME, which is being adopted by a number of European utilities, enables utility companies to save on the cost of communicating to individual meters and provides them with additional smart grid capabilities that are not available with wireless meter technologies.

The business potential for the smart grid is vast, from cutting energy use to improving the environment, saving homeowners and businesses money, and generating revenue for a wide variety of companies in the telecommunications and IT sectors. If played correctly, it really could be an infrastructure and energy revolution, and the best time to get involved is right now.



The author, Amy Cooke, is Strategic Business Development Director at Cable&Wireless Worldwide

“PRIME ... provides utilities with additional smart grid capabilities not available with wireless meter technologies.”

- Amy Cooke, Cable&Wireless Worldwide

M2M Jargon Buster

DECC = UK Dept of Energy & Climate Change



EXPERT OPINION

Look before you leap

What companies should know, and do, before launching an M2M Service

Machine-to-machine connections have emerged as the next big revenue opportunity in the telecom industry. As Tony Jackson, of Convergys Smart Revenue Solutions says, with analysts forecasting up to one trillion potential M2M connections – compared to the three to four billion mobile phones in the world today – it’s easy to see why many mobile operators have already begun to crank up their investment in the market. But with many different companies supplying a virtually limitless number of connected devices in the M2M value chain, communication service providers (CSPs) need to first understand their role in the market and the technology challenges they must overcome before jumping headlong into M2M.



The author is Tony Jackson, Director, Telecoms at Convergys Smart Revenue Solutions

In essence, M2M is a new type of business, and certainly one that owes more to existing wholesale rather than retail models. Treating M2M as a separate operation, with a dedicated business model will be critical to a CSPs’ long-term success and profitability.

Unlike the retail wireless market, M2M is more than just connected consumer devices (for example, cell phones and e-readers), it’s an ecosystem of hundreds of millions of machines with embedded connectivity. In fact, the largest business opportunity lies outside the consumer device space where M2M technology is being leveraged in everything from automobiles, to utility meters, to

heart and insulin monitors, and even vending machines and parking meters.

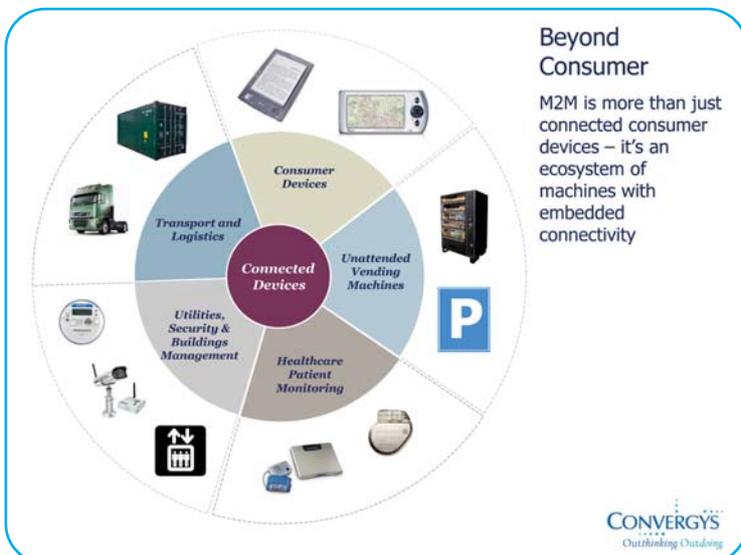
With the introduction of these new connected devices and applications come additional providers like manufacturers, retailers, MVNOs, and specialist M2M aggregators with their own stake in the value chain. The good news for CSPs is that at its core M2M will always require a network operator providing the connectivity, but their role beyond that will largely depend on the device and on their individual business models.

CSPs must add value

Consumer devices such as cell phones, e-readers and connected cameras may be an extension of the existing retail business in that mobile operators sell the device and data subscription, and provide customer care. Although, even then, the customer may view service providers as being the device provider rather than the underlying network operator, **Amazon’s** Kindle being a good example of this.

It’s when you begin to venture into the broader spectrum of connected machines that CSPs will have to look for ways to add value beyond providing the connectivity, by working with the other providers to build joint offerings, co-brand equipment, and propose options to overlay sales, marketing and customer care services.

The new M2M business model will also present some technological challenges for telecom companies’ back office and billing systems:





M2M requires a low cost business model

Service providers will need to be able to support the wireless connections between devices at a very low cost point. This is a significantly different cost point than they are delivering in their retail service today. Whereas providers can expect retail ARPUs in the range of \$20 to \$40 a month, M2M ARPUs are more likely to be less than \$1 a month, save for a few high value applications that could generate up to \$10 per month.

CSPs must look at implementing a dedicated BSS and billing infrastructure, tailored to the needs of the M2M business model. Attempting to leverage functionality and operations through a shared infrastructure with a retail operation would seriously hinder the M2M and the retail business.

Any BSS for M2M requires enhanced automation to reduce the need for costly headcount and in order to accommodate a lower ongoing cost of ownership. This cost pressure will see some CSPs outsourcing this part of their business to specialist M2M platform providers and relinquishing some of the revenue potential in the process.

Business on a massive scale. M2M is a viable revenue generator for mobile operators because of the sheer volume of transactions it promises. A provider could potentially be responsible for the connected service of hundreds of millions of connected devices, each creating micro usage charges. This can be a major challenge for legacy billing systems.

The challenge is not simply one of processing hundreds of millions (or potentially billions) of micro transactions between unique connected devices. The differentiator here is the ability to do this at a reasonable cost; so platforms that are flexible enough to both scale and also run on Linux and a variety of hardware are at a premium. With real-time transactions becoming increasingly prevalent, an M2M billing system must also be able to process a blend of real-time and non-real-time (or batch) transactions and be able to aggregate and summarise usage.

M2M Business Model Challenges

Business model and technical challenges

Low Cost Business Model

- ARPUs likely to be 50c - \$10 per month
- Automate business processes as much as possible to reduce headcount required to support the business
- Choose support platforms that have low ongoing cost of ownership and are flexible for the future

Massive Scale

- Consumer devices – each consumer may now have 5-10 connected devices attached to their mobile account
- Machine to Machine – potentially 100s of millions on unique connected devices creating micro usage charges
- Data management efficiency needed, need to aggregate usage and apply know-how to keep costs down

Multi Party Value Chain

- Global reach is key for some models – partnering with network providers in other countries, need to be able to support wholesale settlement
- Support both retail and wholesale pricing models in the platform
- Settlement and commission payment for multiple different parties

CONVERGYS
Checking Outlines

Added complexity of a multi-party value chain.

CSPs will need a billing platform flexible enough to support an M2M business that may involve numerous partners and a highly complex value chain. M2M will give operators the ability to derive new revenues from settlement and interconnect opportunities, but in turn operators will need their back office systems to be able to make settlement and commission payments of their own. In addition, some business cases may require a telecom to have a global reach. In these instances, wholesale settlement will be essential because operators will need to partner with network providers in countries where they don't have a presence.

M2M represents a potentially lucrative revenue opportunity for the telecom industry, and providers everywhere are jockeying for position. Those companies that take the time to understand the market drivers and upgrade their back office technology infrastructure accordingly will be the ones who land safely on the other side. \$

M2M Jargon Buster

ARPU = Average Revenue Per User

BSS = Business Support Systems

Tony Jackson has global responsibility for Convergys Smart Revenue Solutions Strategy and Marketing within the telecommunications vertical. He has previously held a number of business development, product management and project delivery roles within Convergys and has 20 years' experience of delivering IT solutions across the CSPs and Oil & Gas sectors. Visit: www.convergys.com/smartrevenue/machine-to-machine/



Telecom service providers need to help energy utilities understand the value of the smart grid

Around the world, governments are requiring energy companies to prepare for the smart grid – a two-way network for the distribution of energy, coupled with a communications overlay to enable advanced management of all the network components. As Simon Sherrington of analyst firm, Innovation Observatory describes it here, the smart grid will reach right out as far as devices in the consumer’s home, office or factory.

“Cumulative global investment in intelligent components of the grid (is forecast) at over US\$150 million by 2015.”
- Innovation Observatory

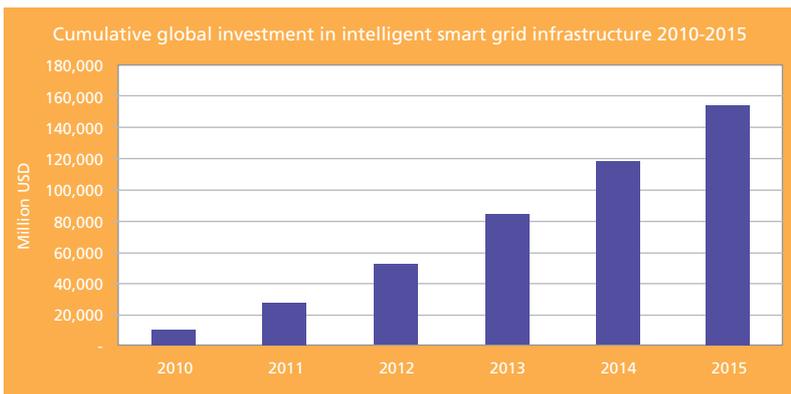
There is still much uncertainty about many aspects of the smart grid. The value to the customer and to the distribution companies and retailers in the energy sector is hard to see, so investment decisions are being delayed. Communications service providers – as a key partner in any smart grid – can bring forward smart grid revenues by showing energy companies the intrinsic value of a communications infrastructure that’s ready for the smart grid.

This is hard to do, though: Energy companies are not typical buyers of communications services – they have a strong in-house tradition and a commitment to standards of reliability that even

incumbent telcos would find stringent. Furthermore, in some markets technical details remain to be resolved concerning the type of communications network that the smart grid will need.

Nonetheless, **Innovation Observatory** believes that the smart grid is coming, and forecasts the cumulative global investment in intelligent components of the grid at over US\$150 million by 2015. And we also believe that telecom service providers have a good story to tell – not just about connectivity, but also about the other changes that will accompany the smart grid – from the links between transactional data volumes and back office systems, through to security and service assurance, churn management and service bundling.

Our smart grid report publishing programme includes a recent study entitled, *Assessing the Smart Grid Opportunity*, which looks in depth at the opportunities for companies looking to supply smart grid infrastructure and services. Forthcoming titles will cover more detailed market forecasts, an examination of the charging and billing requirements for smart grids, and the opportunities presented by home area networks (HANs) for smart grids. 



The author, **Simon Sherrington** is Managing Director of the Innovation Observatory. He has 15 years' experience in consultancy, market and company analysis, and forecasting. Simon has a deep knowledge of fast-moving areas of commerce and industry, in particular the information and communications technology sector. He has undertaken over 50 customised research and consultancy projects for clients, and written over 30 reports analysing various aspects of the telecoms, IT, media and energy sectors.

Innovation Observatory (www.innovationobservatory.com) is a research, analyst and consulting company based in St Ives, Cambridgeshire, UK. It helps companies to better understand the markets they are serving, recognise how industries are changing, spot innovations, improve revenues, open new markets, cut costs and drive profit. Innovation Observatory works primarily in ICT and environmental technology sectors, and is currently publishing a series of reports in the smart grids field.



Mobile cloud M2M will change the automobile

The M2M market encompasses a number of unique industries and devices, one of the fastest-growing being the global automotive market. Forecasts predict that every vehicle manufactured by 2020 will be connected. These vehicles must incorporate and enable service delivery from cloud services, smartphones, mobile devices or other sources. And, as *Leo McCloskey* writes, they must scale bandwidth and accommodate both built-in and brought-in connections while prioritising specific services, such as the eCall mandate in Europe or similarly-legislated safety and security services.

Many complicated challenges exist for this future. New, broad and changeable eco-systems are emerging to service this burgeoning market opportunity. With 440 million vehicles on the road in North America and Europe, the market opportunity is measured in the tens of billions of dollars to companies that can successfully enable connected vehicles.

Consumers and businesses alike will see advanced machine-to-machine (M2M) services take shape. These may be the result of mash-ups that integrate navigation and social apps with voice recognition and text-to-speech capabilities. Or they may be entirely new categories of services.

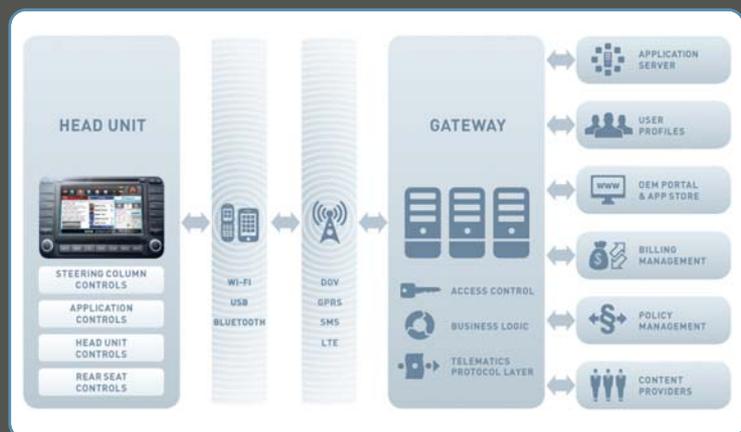
To enable such an amorphous future, a focused effort is needed on creating an infrastructure to provide a 'future-proof' service delivery platform for automakers and their consumer and commercial customers.

Collaboration is essential, including automakers (both central and regional planning), mobile network operators, content companies, ISVs, and breakdown and emergency services. Since the vehicles of 2020 will also include alternatively-powered electric or hydrogen vehicles, the list will add utilities, charging locations, hydrogen locations and other energy-focused participants.

Where to today, sir?

By 2020, when you start your vehicle, it will recognise you and drive automaker customisation and individual personalisation to the vehicle, conforming to your digital lifestyle. The vehicle will consider best practices for consuming content while minimising driver distraction.

Driver-preferred content and services would be easily useable via the vehicle's smart display, so that the driver never reaches for a device while driving. Content and services behaviour would adapt to the vehicle state, location and other rules. Moving images will become static once the vehicle leaves 'park'. And parents can provide additional rules that, for example,



prevent texting of any sort while in the car.

Fleet and logistic needs

Such services also have commercial implications. The fleet and logistics worlds that employ proprietary equipment and protocols will be incorporated into a largely IP-based environment, creating greater freedom of choice and portability between fleet management providers. This further expands the eco-system to include insurance companies, leasing agents, car rental, car sharing and other commercial market participants.

Given the wide choice in consumer and commercial vehicles, an adaptive, cloud-based service delivery platform is clearly required. The mobile cloud would hold an abstraction of the branded in-vehicle experience for each and every driver, and integrate with other providers that comprise the driver's digital lifestyle.

The result is an automotive industry that customises to markets, personalises to drivers, and conforms to legislation and best practices for content and service consumption within the vehicle. We each get our car our way, and it will be just as familiar to you as your smartphone is becoming today.



The author is **Leo McCloskey**, Vice President, Marketing, Airbiquity

M2M Jargon Buster

ISV = Independent Software Vendor



EXPERT OPINION

Medicine goes wireless: A paradigm shift

Today, chronic diseases such as diabetes, heart disease and other recurring conditions top the list of health threats that impact the greatest number of people and contribute to the high cost of modern healthcare worldwide. As Axel Hansmann writes, the cost for treating chronic conditions accounts for an estimated two-thirds of worldwide healthcare spending.



The author, Axel Hansmann, is Vice President, Strategy and Marketing, Cinterion

In the US alone, at least 160 million people are projected to have at least one chronic condition by 2020^[1]. Wireless technology is poised to greatly reduce the cost of treating these conditions and improve overall quality of life for millions, giving us the ability to stay connected to people, data, machines and devices and greatly improving productivity, efficiency and ease of living.

While many cutting-edge devices continue to hit shelves, the standard infrastructure has been in place for decades and the healthcare industry is quickly finding ways to capitalise on the wireless advantage to solve critical challenges faced by an overburdened system.

Health risks

According to research by the **Continua Health Alliance**, a non-profit, open industry alliance of healthcare and technology companies, there are more than 1 billion overweight adults in the world today, a risk factor for chronic diseases such as high blood pressure, cardiovascular disease, gastroesophageal reflux disease (GERD), polycystic ovarian syndrome, and many, many more.

This challenging situation is compounded by the fact that the world population is ageing, with 600 million people now aged 60 or older². The risk of disease increases dramatically after 55 years of age. On average, the morbidity of an 80-year-old is 6-7 times higher than that of a 30-year-old. At the same time, and depending on the healthcare system, retired people typically contribute less for health insurance premiums, further burdening the financial structure.

The statistics are alarming! Healthcare systems around the world are overtaxed and facing exponential cost increase over the next years. In the US alone, healthcare expenditures surpassed \$2.3 trillion in 2008 – more than eight times the amount spent in 1980. Stemming this spending growth has become a major policy priority, as the government, employers, and consumers struggle to keep up with costs².

Wireless technology

It's not a surprise that the medical industry is turning to wireless technology to bring about dramatic improvements in healthcare. Telehealth or mHealth solutions integrate cell phone-based or M2M-based wireless communications to improve patient treatment and simplify healthcare delivery.

Most medical devices work as individual units, monitoring one aspect of health for a specific purpose. However, new telehealth solutions use cellular M2M technology and web-based platforms to connect monitoring devices, aggregate medical data and visualise overall patient well-being for improved treatment. The new systems allow quick and easy access to medical data and deliver a clear and complete picture of a patient's health without ignoring the important aspects of security, safety, and privacy of the patient and medical professional.

Telehealth solutions can be used for a variety of purposes: monitoring patient compliance during medication treatment (pill reminders); monitoring and managing elderly and chronic disease patients with wearable "health monitors" (Ambient Assisted Living); monitoring patients with diabetes and providing prompts to help bring blood glucose levels back to a normal range (Chronic Care Management) and much more. With a telemonitoring device, a consulting physician can remotely monitor a patient's health status and chronic condition in real time and immediately react in case of emergency – no matter if the patient is at home, on the bus, or at the movies.

Consistent and real-time oversight can greatly improve treatment, keep patients healthier and avoid expensive hospitalisation. In fact, a recent study by **Philips** showed compelling and tangible benefits gained from telehealth solutions: 89% of health agencies reported an increase in quality outcomes, 76% cited reduction in unplanned hospitalisations, 77% experienced a fall in ER visits and 76% reported patients improving self-care by proactive disease management². →



It's been said that necessity is the mother of all invention. Care givers, health providers, insurance companies, governments and citizens the world over find themselves pinched by the need for more healthcare services but with fewer resources to cover expenses. Fortunately, wireless technology and services have evolved and expanded rapidly and can now provide critical relief to the overburdened healthcare system. Medical device manufacturers are developing and launching a new breed of mHealth solutions using M2M modules that will undoubtedly solve some of these challenges.

Mobile network operators (MNOs) have now fully embraced the promise of M2M technology which is accelerating the mHealth revolution. mHealth solutions are attractive to MNOs because they typically use very little wireless network bandwidth for operations and subscriber churn is extremely low compared to the typical cell phone customer. Most of the world's major MNOs have developed separate business divisions devoted to growing the M2M market segment.

Similarly, advances in module and sensor technology such as miniaturisation and smart textiles are contributing to make telehealth applications unobtrusive and easier to use, while providing continuous medical support outside of the doctor's office or emergency room.

Comfortable and convenient sensors increase mobility and independence, making mHealth solutions more attractive to patients. For instance, health sensors can now be easily integrated into a discrete wristwatch that allows people suffering from medical conditions to take advantage of mHealth solutions without being stigmatised. Patients want freedom and mobility while at the same time, they need the sense of security knowing that help is just around the corner if disease conditions suddenly worsen.

Proven technology

Fortunately, M2M technology has been around, with impressive results, much longer than mHealth solutions. **Cinterion's** M2M modules and **Gemalto's** digital security solutions and SIM cards have already been field-proven in industries that require the highest quality, security and reliability standards for wireless data transmission.

Challenges such as securing patient data and privacy were successfully mastered years ago in M2M solutions for point of sale (POS) terminals and automated teller machines (ATMs). The rigorous specifications for utmost quality, reliability and durability required for telehealth applications are similar to the stringent automotive industry standards where M2M has been widely applied for many years.

M2M technology has come a long way from the early days, and provisioning processes have become easier with Java-embedded modules that make preconfigured devices easy to use. Better than plug-and-play, these devices work out of the box!

A lingering inhibitor to mHealth adoption has been determining viable business modules and reimbursement schemes. Insurance companies have been slow to approve coverage of mHealth solutions until clinically proven success is documented. **Healthimo**, a pioneering healthcare company, is paving the way with its clinically proven, outcome-driven diabetes education programme which relies on the GlucoMON[®] mHealth device to wirelessly send blood glucose data to Healthimo's clinical operations centre. And new players such as **Microsoft[®] Healthvault**, **Google Health**, and others, are jumping on board to implement new business models in an eco-system that provides huge potential for savings but is reluctant to change.

We are at a crossroads in medicine where the pressure of skyrocketing healthcare costs is motivating technological innovation and invention. Innovation, proven medical outcomes, improved quality of life and convenience plus MNO support are fueling mHealth adoption.

The opportunity to help and transform is here. An independent study predicts that the market for telehealth and home health monitoring for the US and EU combined will grow from \$3 billion in 2009 to an estimated \$7.7 billion by 2012¹. Change will come, however, it will take the collaborative effort of wireless and medical industry stakeholders to usher in a much-needed paradigm shift in healthcare delivery to improve care for those suffering while reducing the spiralling cost burden for all of us. +

**“(With telehealth)
77% of health
agencies cited a
reduction in ER
visits.”
- Axel Hansmann,
Cinterion**

¹ Gerson Lehman Group, *Wireless Medical Devices Herald A New Revolution In Health Care*, July 2010. <http://www.glgroup.com/News/Wireless-Medical-Devices-Herald-A-New-Revolution-In-Health-Care-49298.html>

² Davis, R. *Continua Health Alliance Overview Presentation* http://www.continuaalliance.org/static/cms_workspace/Continua_Overview_Presentation_v13_9.pdf

³ Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group, *National Health Care Expenditures Data*, January 2010. http://www.cms.gov/nationalhealthexpenddata/01_overview.asp



Olivier Pauzet,
Sierra Wireless:
Not a lot of
money to make
this happen

Get well soon

The use of wireless technology for remote monitoring of patients is expected to take off in a big way over the next two years. Steve Rogerson looks at what is driving the market.

The use of wireless machine-to-machine (M2M) communications in the medical world is still very much in its early days. But many in the industry see this as a potential mass growth market over the coming years, as governments and health authorities look at ways of cutting costs while improving the quality of life of patients.

The big driver is the ability to allow more people to be treated at home, with data on their state of health being automatically transmitted back to the medical staff. This not only frees up hospital beds for more critical patients, it is far cheaper and the patient is happier being in familiar surroundings and often able to lead close to a normal life.

However, early medical applications are also appearing in the sports and fitness sectors, where people can use wireless technology to monitor their progress and compare that online with friends and peers. But where there has not yet been a breakthrough is in critical life or death applications, where costs and the delays in equipment of this nature going through approvals processes are slowing the market.

"The business case is difficult to find because you need someone to pay for it, either hospitals, insurance companies or the public," said Olivier Pauzet, Director of Segment and Product Marketing for **Sierra Wireless**. "There is not a lot of money to make this happen."

André Malm, an analyst at **Berg Insight**, added: "And the technology cycles in medical are not on the same page as in other industries. It differs significantly from other M2M markets. The infrastructure is more complex and there is a completely different set of players. There is a different mindset about how to do business."



André Malm,
Berg Insight:
Medical
technology
cycles not on the
same page as
other industries



Karsten Viuf,
Nabto: Security
procedure also
involves the
patient

Well-being

But for what Pauzet calls 'well-being' applications – for example, sleep apnoea – individuals are willing to spend money as it helps to give them a good night's sleep. Remote wireless modules for sleep apnoea do exist and these are monitored by the hospital to fine-tune the treatment. Similarly, wireless devices are out there monitoring glucose levels in diabetes patients with doctors having access to the data in real time.

Pauzet estimates that there will be about 300,000 remote health devices deployed in the field in 2011 with about 90% being used for this type of well-being application. There are about half a million systems already deployed, the bulk of them in the USA with Europe lagging behind; the European market is more fragmented and the programmes tend to be on a smaller scale than in the USA.

"Medical is a very small market compared with the whole M2M market, but we see strong growth moving forward," Pauzet said. "It will be starting to grow for 2012 and 2013."

Most of the systems already deployed are for monitoring the vital signs of elderly patients. These are also interactive in that they ask the patients questions about how they are feeling, and this gets added to the gathered data. Malm estimates that the number of installed systems doing this will double over the next two years.

But with cost being a major issue, the technology needs to improve and all the signs are that steady progress is being made as the market matures. Pauzet is seeing similar trends with the wireless modules as happened in mobile phones, where new features that were initially expensive add-ons become integrated →



into the main microprocessors in later models.

For example, rather than having a device in which, say, the glucose monitoring is handled by a separate module this becomes integrated into the main module on later products. Likewise, the necessary security features can also be embedded into the main processor.

Security

One company that can help with the security side is **Cypherbridge Systems**. Its CEO, Steve DeLaney, said: "Customers are concerned with data integrity and protecting the data over the networks. They don't want channel errors. With medical devices, they need to achieve patient privacy and they are concerned with the accuracy and integrity of the data."

He said that wireless networks were not always as reliable as wired networks and thus encryption was needed to protect the data.

One company that uses this type of security and encryption is **Nabto**, makers of hearing devices and blood pressure monitoring equipment.

"We use a firewall blocking the ability to connect to the sensors," said Karsten Viuf, Nabto's Sales Director. "There will be a small footprint of software on the device itself, and when it gets an internet connection there will be an exchange of certificates before the connection is established. There is also a security procedure before that involving the patient pressing a physical button on the device."

Nabto's devices are undergoing clinical trials with a few hundred users. "We have implemented this for a few customers," said Viuf, "but from coming up with an idea to getting final approval can be very long, two to three years."

To help speed up the approvals process for these types of module, some companies are pre-approving critical parts of the system, for example the real-time operating systems that control the software in the modules.

"More and more medical device manufacturers want help getting regulatory approval," said John Carbone, Vice President of Marketing for real-time operating system provider **Express Logic**. "By providing them with an approved operating system off the shelf, it saves them understanding how it operates."

This works for both Europe and the USA where different approval methods exist. In Europe, certifications for the operating system and other parts of the product have to be submitted to the IEC in advance. In the USA, the FDA does not require the certification in advance but can demand to see it if a problem arises in the field. Either way, the certification has to be there.

Another problem if the market does take off will be

the vast amounts of data coming in for medical staff to analyse. And they have to be analysed. If a patient suffers or dies and it can be shown that the necessary data arrived but was missed or not acted upon, then hospitals and doctors could be liable. This is why companies producing this type of equipment are now looking at automatic algorithms to monitor the data and only report if they go outside set parameters.

"We also don't have the knowledge yet of how much the data change during the course of the day," said Malm. "We haven't got the knowledge of monitoring all the vital signs continuously because it simply hasn't been done. So, when we start getting these data there will have to be more research to look at the data and see how useful they are and what you can do with them."

Jayanth Krishna, Director at **Mindtree**, added: "You need analytics to study the data so they only trigger alarms if thresholds are passed."

Network operators

Cellular network operators are excited about this market because, as they suffer from falling voice revenues, they see the possibility of such vast amounts of data being transmitted over their networks as a potentially large source of income. "The carriers are interested in this segment," said Krishna. "I have talked to them and they are interested in working in this segment."

Some, though, are worried about liability issues if critical data are lost due to a quality of service problem in the cellular network, most do not regard this as a major problem. "They don't have a lot of concern with quality of service," said Krishna. "Most applications are continuous monitoring rather than emergency monitoring. If someone is critically ill, they will be in hospital."

Axel Hansmann, Vice President of Strategy for **Cinterion**, is also confident over this. "We will see the implementation of life-critical applications," he said. "In terms of flexibility for elderly people who want to stay at home and go out and enjoy life, they will be willing to take the risk."

He said that a system that worked 99 times out of 100 was better than no system at all, but he acknowledged: "Some mobile phone companies are worried about claims if they lose the connection."

Conclusion

The market for these types of applications is still in its early days and there are technical and logistical problems to be overcome. But there is a general confidence that, with an ageing population already adding pressure to a struggling health service, this is the only way to go.

"It's a very exciting market," said Hansmann. "We think this will take off because of the savings that can be achieved." +



John Carbone, Express Logic. Approved operating system off the shelf



Jayanth Krishna, Mindtree. Network operators are excited about this market



The author, Steve Rogerson, is a freelance technology journalist

"Customers are concerned with ... protecting the data over the networks."
- Steve DeLaney, Cypherbridge Systems



M2M Alliance: Networking for M2M technology

Membership of the M2M Alliance is open to all M2M technology providers and users of machine to machine communication. Our objective is to increase awareness of the opportunities created by wide ranging M2M technology and associated solutions for both business and commerce.

We seek to encourage further technical development, innovation and harmonisation. In so doing, we provide our members with a competitive edge, and also to those who implement this technology.

The M2M Alliance offers its members a forum for the exchange of ideas amongst industry experts, and acts as the public spokesperson. As this spokesperson, the M2M Alliance is also the contact point for associations, politics, management, technical colleges of further education and other organisations. Proactive communication and networking is at the heart of the M2M Alliance, both between members and with external organisations.

This is done through a regularly published journal, extensive press work and an annual congress, which gives the results of a survey of trends, and best cases in M2M technology through presentations, workshops and fora. The M2M Best Practice Award completes these activities. 

Further information can be found at: www.m2m-alliance.com

What's On

Connected Home Global Summit

May 24 – 26, 2011, London, UK

www.avrevents.com/home.asp?Event=ConnectedHomeEU2011

The Connected Home World Series will examine broadband access strategies, advances within home networking and entertainment sectors and explore technology choices and the evolution of converged devices and platforms. Topics to be covered include:-

- Connected Home: All things to all people?
- Home Alone: Winning the battle for the Connected Home
- Devices & Desires: Handhelds enter home devices market
- Need for Speed: Sizing the Connected Home market
- Defining the device – where is the mobile internet heading?
- Application Stores – Open for business
- Unlocking the embedded market – M2M 

Next Generation Mobile Devices

May 26, 2011, London, UK

www.avrevents.com

Next Generation Mobile Devices will focus on identifying and discussing the key issues around strategic priorities for mobile broadband devices, examining Open-OS enablers, application / content drivers, HSPA+ and LTE air-interface evolution, exploring embedded connectivity options, and more besides.





vodafone™

Vodafone foresees 'trillions' of connected devices

Vodafone has provided machine-to-machine connectivity for its customers around the world in a wide range of industries and across a diverse set of applications, whether for fleet management, security or point of sales (POS). In a quickfire interview, M2M Now talks exclusively to Erik Brenneis, Head of M2M at Vodafone Group, to get his views on some topical issues and assesses the operator's services in a few key areas.

M2M Now: Erik, how should network operators cost-effectively provision the vast quantity of SIMs that are forecast for M2M and connected devices over the next few years?

Erik Brenneis: Vodafone has innovated in the M2M space by creating a dedicated M2M mobile network, specifically designed and dimensioned for very high quantities of SIM cards and high simultaneous volumes of requests from M2M devices. This allows Vodafone to offer a consistent and cost-effective way of providing services to very large numbers of M2M devices.

M2M Now: Will IPv6 guarantee device addressability, or are there still challenges here?

EB: IPv6 will allow trillions of devices to have a unique address that is not currently possible with IPv4 commonly used on the internet today. It will allow an unlimited amount of public addresses for devices.

IPv6 will change the way devices are addressed, and applications are designed, and will become more common when LTE networks and LTE modules are deployed in the future.

M2M Now: When businesses look for embedded device solutions do they generally approach Vodafone directly, or is it more often through an MVNO or VNO?

EB: They are approaching us more and more directly, as it is known that we have a global M2M organisation and offering and can therefore serve their needs. MVNOs are used more and more for smaller customers only.

Vodafone also has an extensive network of M2M partners such as Value Added Resellers to complement its own direct sales force and efficiently serve all customer needs across the entire M2M market.

M2M Now: How does Vodafone guarantee SLAs for M2M communications with life-critical devices in healthcare areas such as cardiac and diabetic care?

EB: Vodafone has a well-established Customer Service support model for all its M2M customers, which include specific service level agreements around our core M2M solution. Once the SLAs are agreed with our customers, the elements that ensure the delivery of these guarantees are dedicated Service Delivery and Solution Architects in all our customer countries, Vodafone's M2Mplatform, a 24/7 global M2M helpdesk, and regular customer service reviews.

M2M in practice

Machine to machine (M2M) communications let businesses monitor and control devices and processes remotely across almost all industry sectors. Affordable hardware and fast wireless data networks mean that →



Erik Brenneis,
Vodafone Group:
Dedicated M2M
mobile network

Ctrack/Digicore delivers multi-country fleet management

Worldwide, **Ctrack/Digicore** is one of the top five providers of 'track and trace' systems, helping businesses manage their vehicle fleets and improve productivity. It has operations in South America, Asia, Africa, Australia and more than 12 European countries.

Vodafone provides M2M connectivity over its GPRS network. Ctrack/Digicore can manage and activate its SIMs across many countries from its European headquarters, and remotely upgrade devices that are already in the field. The companies are working closely together to unify pricing for roaming across Europe, meeting customer expectations and simplifying contracts.



companies can add new capabilities, improve efficiency and connect with their end users in applications such as remote monitoring, security and fleet management.

M2M connectivity is business-critical. Vodafone is building on its 20 years' international experience in M2M, to bring together the necessary elements for international M2M deployments, including consultancy, wireless connectivity and management tools. The operator provides an M2M solution support helpdesk, international network coverage, and a dedicated platform which separates M2M traffic from general voice and data traffic – so that it can deliver the right level of service for each M2M application.

The operator provides customers with a single, international, country-independent Subscriber Identity Module (SIM), helping them provision and manage their own SIMs for international applications. Vodafone provides end-to-end services all the way from the mobile unit to the back-end router at the customer premises, backed up by a Service Level Agreement (SLA).

Where necessary, Vodafone can also provide an Internet Protocol (IP) service gateway for multiple alarm centres or Point of Sale (PoS) acquiring points. This makes it easier for new customers to add M2M capabilities, without needing their own infrastructure. 

Case Studies

Technocon provides security services with M2M

Technocon is the largest supplier of professional theft detection systems in the Netherlands, and delivers its services across many European countries to customers including some of the world's largest automotive manufacturers. These services include car security, fleet management, and alarms for residential and business properties. It has more than 23,000 customer nodes in service with connectivity provided by Vodafone.

Technocon uses a private Access Point Name (APN)

supplied by Vodafone, and provides links for its customers with secure solutions running over Vodafone's GSM and GPRS networks. Technocon required a portal for managing and activating SIMs across multiple countries, which Vodafone was able to provide, along with expert support and reliable SIM delivery. Vodafone provided a complete solution, including SIM ordering, marketing support and technical help.



M2M for parking management

Managing where we park our cars is an essential part of everyday life to ensure our cities don't grind to a halt. M2M connectivity is increasingly being applied in this sector, enabling more sophisticated management of public parking and off-street parking garages and areas. Terminals can provide access control to authorised vehicles for private or restricted facilities, and can take payment at public parking meters or car park pay-stations.

In the Netherlands, **Taxameter Centrale** provides solutions to manage parking, including hardware, software and maintenance contracts. It has an installed base of more than 3,000 SIM cards in M2M applications, a number that is steadily increasing as older parking systems without transaction and management functionality are replaced, and as new projects are rolled out. Taxameter Centrale has a dedicated link with Vodafone, which allows it to securely process transactions and provide an end-to-end solution for its customers.

POS and transportation smart cards

CCV is the leading service provider of electronic transactions in Europe. Its core business centres on electronic payment traffic within Europe, with branches in Belgium, Germany, and Switzerland. CCV uses pin and 'Chipknip' (stored-value card) terminals, specialising in the processing and online authorisation of financial and loyalty card transactions, as well as the development and management of loyalty and customer card systems.

The company provides standard products as well as customised end-to-end solutions, and operates a 24-hour service organisation and a back-up computer centre that guarantees a seamless switchover in breakdowns or emergencies. As might be expected,

reliability is key for CCV in its M2M links, so CCV is using several network service providers, as well as Vodafone to provide M2M connectivity. M2M is used for POS payments and for the public transportation, pick-up and loading device (OV-chip system).

CCV also receives support from Vodafone, in SIM ordering, activation support and a SIM management portal. The company was able to adopt a new go-to-market model to sell a complete packaged solution, including hardware, communications, services and support. CCV is aligning its international operations, and moving towards central buying, logistics and support for its communications services. 

M2M Jargon Buster

GPRS = General Packet Radio Service (2.5G)

(M)VNO = (Mobile) Virtual Network Operator

VAR = Value Added Reseller



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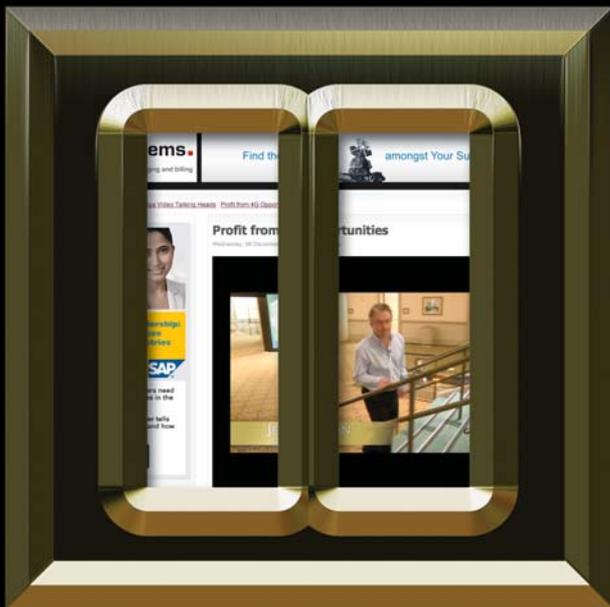


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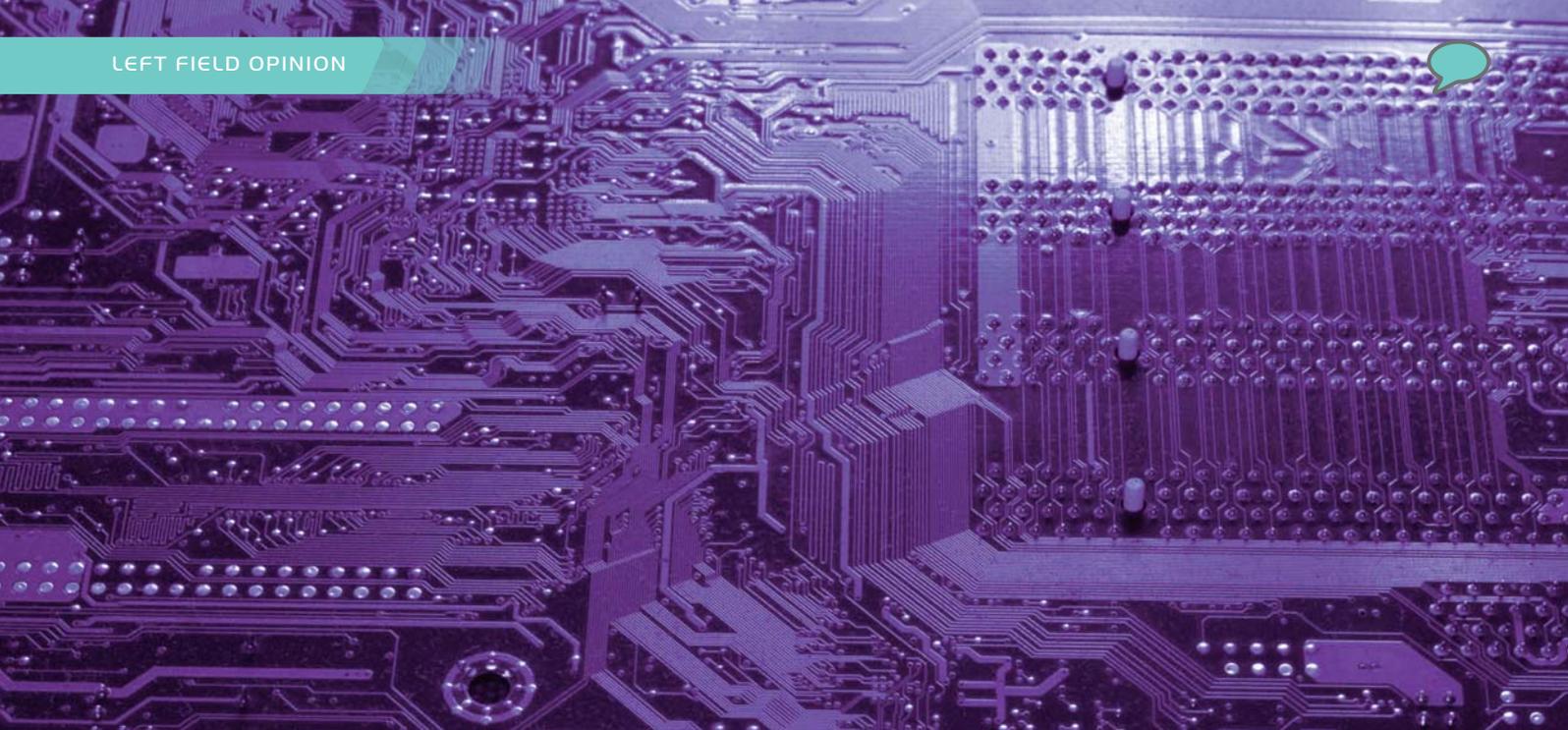
“..... the video was a stunning success with over 460 downloads in 2 months. The icing on the cake was working with the staff and video crew that made this such an enjoyable, stress-free project”.

Debbie Madden, Marketing Manager, JDSU

TALKING HEADS.....



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M2M: It's not about machines – it's about the network!

Billions and billions of machines, chattering away to each other; playing a role in every facet of our lives, our business and our communications; further accelerating the consumption of network bandwidth. That's the vision many companies, especially network element vendors, are banking on.



The author, Barbara Lancaster, is President of Texas-based consultancy firm, LTC International

It is, of course, already happening: You lose control of your car on a slippery road, spin out of control, bump into the guardrail and your car's airbag deploys. At that instant, the deployment triggers a machine-to-machine (M2M) communication to the safety service, alerting them to the fact that you may need help. And a person calls you to check what assistance you may require.

Or imagine that a network element senses it is missing its performance targets. First of all, it hands off its traffic to another element, initiates a trouble advice and waits for repair. Essentially, everywhere telemetry can be used to collect data, its findings can be turned into various triggers that initiate a communication from one machine to another. These are usually asking for action to be taken, and sometimes just for gathering information.

A wave of M2M ideas

Hundreds of new machine-to-machine ideas are emerging – almost as fast and furious as new smart phone apps. What could possibly slow up this tidal wave of technology?

Well, it really all hinges on our telecommunications networks. Mostly these devices communicate wirelessly, and while individually they may consume only tiny amounts of bandwidth, when trillions (or quadrillions) of them are all communicating, the network will have to keep up. The network will have to be very, very fast, and very, very cheap to make this stage of the industrial revolution take off. Oh dear! This takes us squarely back to the raging argument about big fat pipes, intelligent edge devices and the merits of being a

phenomenally efficient carrier of bits.

As readers familiar with my column in VanillaPlus magazine will already know, I think that carriers own one of the most important assets on our planet. The more things we think of using it for, the more indispensable the owner of the network becomes.

This is NOT marginalisation

I really do not understand all of the energy being put into fighting commoditisation, as if that were some sort of plague. It seems to work out quite well for the electricity companies, the coffee vendors, and even the petroleum industry. Perhaps some folks have commoditisation confused with marginalisation – which would be bad. But marginalisation is not the same as commoditisation, so let's get on with driving more and more revenue-generating traffic onto the network please.

Imagine being the single most important enabler of this next generation of leading edge technology. Imagine making slivers of revenue from every single one of those quadrillions of M2M communications. Forget about the complexity and expense of sniffing out every movie download and every e-book to be able to attach a premium. Forget about the sophisticated and expensive policy management tools needed to throttle back all but the highest paying customers.

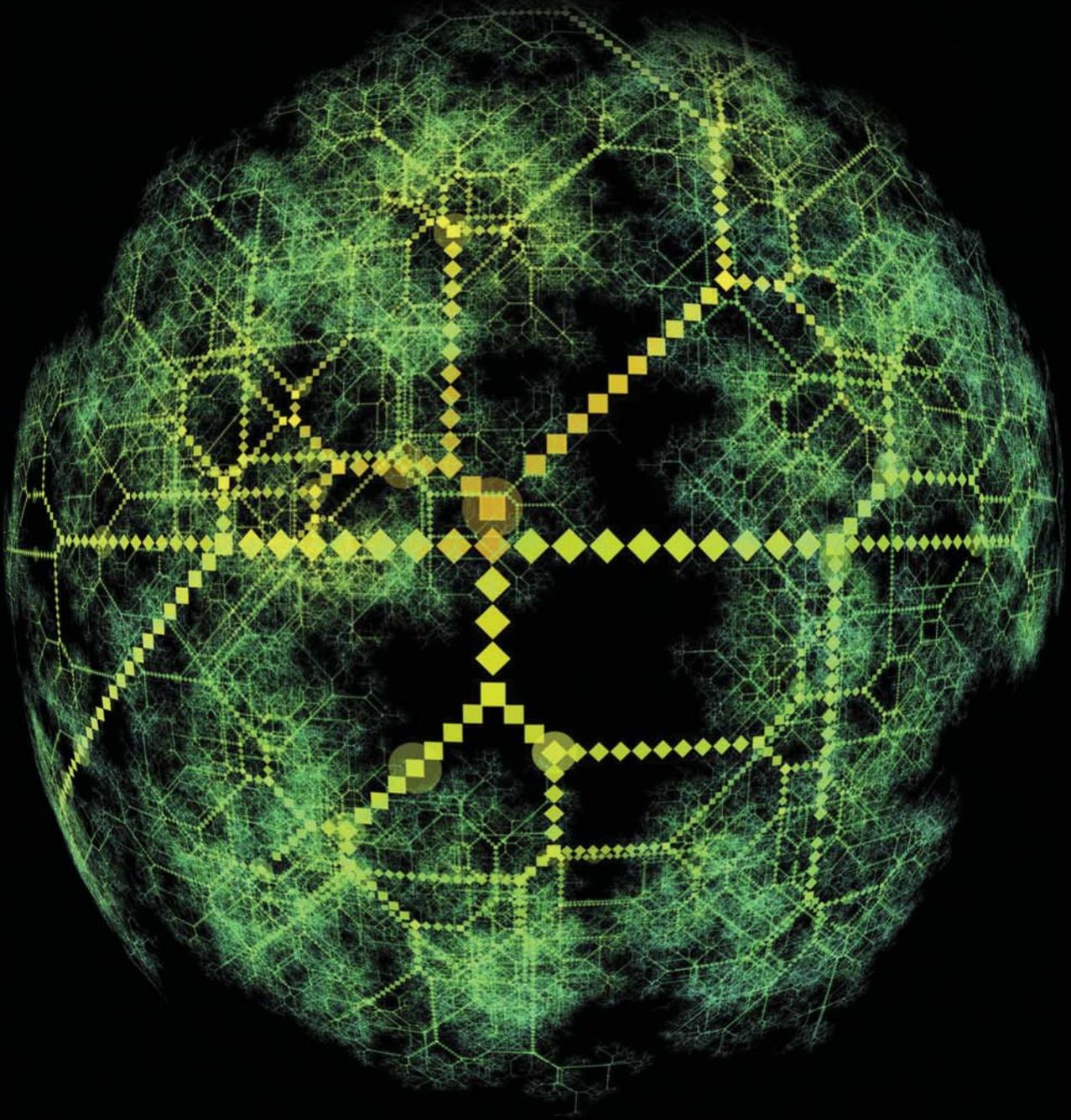
The machines are coming and what they really need to reach their full potential is an ecological niche in which they can flourish: a network that is ubiquitous, reliable, open, and cheap. Go for the bits; lots and lots of bits!

“When trillions or quadrillions of devices are all communicating, the network will have to keep up.”



blog-led website and quarterly magazine for
machine to machine communications

the latest news, reviews and insights in the world of M2M



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Profit from a world of connected devices

“When is an accelerometer more than just a fun gadget for your phone?”

When it is CeNSE (Central Nervous System for the Earth)

Machines can not only be put to work reporting how much electricity you have used at home, they can also improve our lives:

- What if you could send an electrocardiogram to your physician by laying your hand on a small tabletop sensor at home?
- What if your home knew when someone was in a room without having security detectors in all rooms?
- What if we could find oil without drilling holes as our primary method of exploration?
- What if we could know of structural problems well ahead of a bridge or building failure?

All of these things and more are possible today with the application of HP Lab's CeNSE-ing technology and HP Communications & Media Solutions (CMS) Real Time Data Acquisition and Mediation products.

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